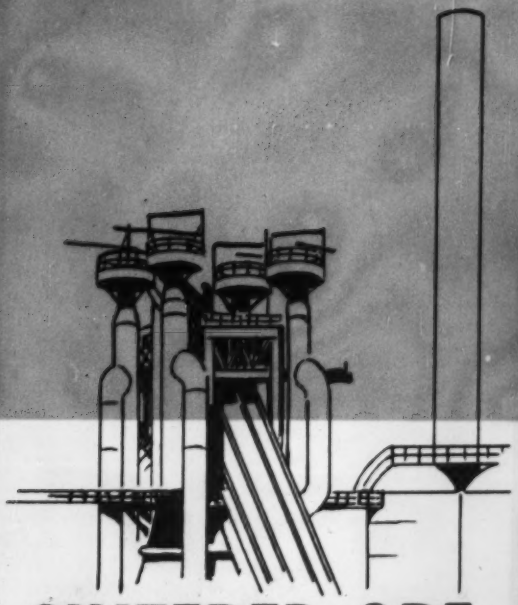
SEPTEMBER 26, 1955

STEEL
The Metalworking Weekly



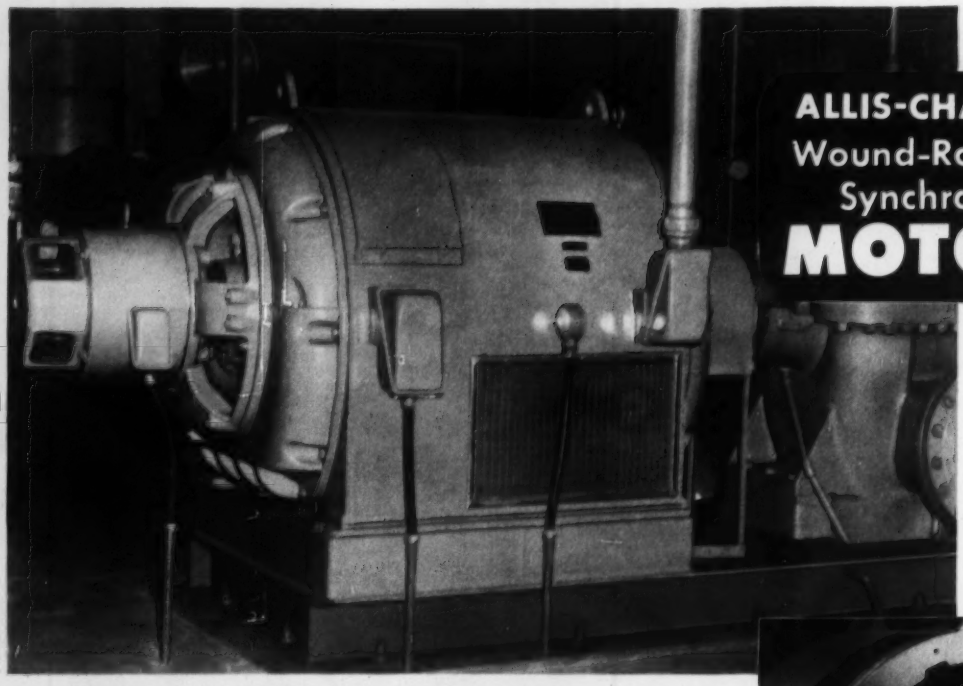
SINTERED ORE
New Glow in Blast Furnace Economy

—page 112

✔ Aluminum Capacity To Double by 1975 . . . page 69

✔ Next Year's Auto Production Outlook . . . page 83

CONTENTS — PAGE 5



ALLIS-CHALMERS
Wound-Rotor and Synchronous
MOTORS

Shown is a 400-hp, 900-rpm end-shield bearing synchronous motor. Other Allis-Chalmers motors of this design are available from 250 hp at 300 rpm and up, in drip-proof and splash-proof construction.

Now full protection without loss of accessibility

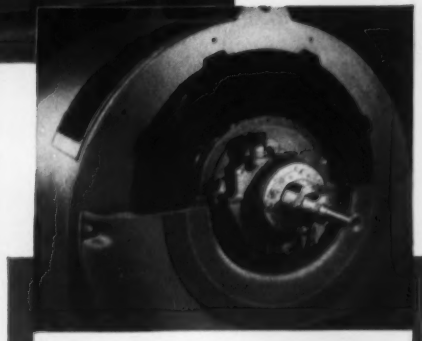
All parts, including slip rings and leads, are enclosed — yet removable inspection covers and end-shield sections simplify maintenance.

These motors combine modern functional design with maximum protection and accessibility.

Here are some of the important features:

- Collectors and brushes are protected by box-type stator yoke from physical damage, dripping moisture, dust and dirt.
- Cast end shields provide rigid bearing support and full protection for motor windings.
- Slip-ring leads are brought out to a terminal box — they are not left exposed.
- Capsule-type sleeve bearings permit inspection or cleaning of motor windings without exposing interior of bearing to dirt.
- Access covers are secured by easy-operating, self-locking fasteners for ready removal.

Get details — Call your nearby A-C office, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 05R8183.



Note accessibility offered by generous size opening covers. Upper half of end shield is removable for entrance to motor winding.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

A-4847

Architect: Port of New York Authority; *General Contractor:* S. S. Silberblatt

Bolted Joints Used in Steel Frame for New Hangar at Idlewild

These trusses are part of the steel framework for the enormous new Hangar 8 at New York International Airport, Idlewild. The hangar, about 440 ft, in length was constructed by The Port of New York Authority to house airplanes of the United Airlines fleet.

The structure has a 99-ft-wide service core along its entire length. Roof trusses spanning this core are cantilevered 133 ft out on either side, forming two bays measuring 440 x 133 ft. Because of the ease of access desired, exterior structure supports were prohibited. The steel framework for the hangar was bolted, Bethlehem High-Strength Bolts being used for all of the main connections.

Bethlehem High-Strength Bolts are ideal for joining structural members because they retain their full clamping force, thus providing permanently tight joints. They can be installed quickly, with minimum noise. And being placed cold, they do not present a fire hazard.

Bethlehem High-Strength Bolts are used with two hardened washers, one under the head, the other under the nut. A calibrated pneumatic impact wrench tightens the nut on the bolt to predetermined tension. This results in tremendous clamping pressure.

Bethlehem High-Strength Bolts are made from carbon steel in a wide range of lengths and diameters. They are heat-treated by quenching and tempering. They meet every requirement of ASTM Specification A-325.

If you have any questions about the use of Bethlehem High-Strength Bolts, you'll find the nearest Bethlehem sales office at your service. Why not put in a call for them now? Or, if more convenient, write direct to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

JACK & HEINTZ

Saves $1.05 per hour...

Jack & Heintz Inc. silver brazes over 25 different parts on this 15 KW, 10,000 cycle TOCCO machine.

with TOCCO* Induction Brazing

Brazing Costs Down

When Jack & Heintz engineers switched from torch brazing to automatic induction, brazing cost of these inverter brush mounts fell from $.05 to $.006 each —a reduction of 83% in direct labor costs alone! Additional savings result because less cleaning is required after TOCCO, and fuel costs are much lower, too.

Brazing Production Up

While costs dropped, production on the part zoomed —from 40 to 360 brazed assemblies per hour. Furthermore, rejects and scrap, formerly high, are now negligible.

Versatility

The part shown is just one of over 25 parts, large and small, which alert J & H engineers have converted from old-fashioned brazing methods to modern, automatic TOCCO. Overall brazing costs (TOCCO brazing versus former methods used) are down 75%—brazing speed, up 100%.

* * *

If the manufacture of *your* product involves brazing, heat-treating, forging or melting of ferrous or nonferrous metals, don't overlook TOCCO as a sound method of increasing production, improving product quality and slashing costs.

THE OHIO CRANKSHAFT COMPANY

TOCCO

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-9, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Brazing and Soldering".

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

Save up to $500 on your next gas fork truck

Priced about 25% under any other gas trucks in the popular 4000 lb. capacity, the Yardloader now brings cost-saving fork truck operation within the reach of practically every company with yard-handling problems. Travel speed approaching 14 miles per hour, large pneumatic tires, exceptionally high ground clearance and oscillating trail axle make it the ideal truck for outdoor service over large unimproved or semi-improved areas.

Heavy-duty industrial engine of proven make, 4-speed transmission and extra-heavy drive axle assure ample power for top performance under any conditions. Hydraulic lift to 122 inches, automotive-type steer, convenient controls and excellent driver visibility are a few of the features contributing to safety and ease of operation.

Get all the facts—and save up to $500.00 on your next gas fork truck. Write to The Baker-Raulang Company, 1259 West 80th St., Cleveland 2, Ohio.

BAKER

"Yardloader"

TRADE-MARK

5GY4

Here's the Complete "Package"

for Counting Electrically...

Added Evidence that —

Everyone Can Count on VEEDER-ROOT

This Veeder-Root Reset Magnetic Counter (AC or DC) is actuated through electromagnets. And it may be connected in series with any device having a contact arrangement . . . like the specially designed Veeder-Root Electrical Contactor at the left, which insures positive operation of the counter, either in oscillation or connected directly to a revolving shaft . . . with the counter placed at *any* distance from the machine or process on which the count is required.

This is another one of the hundreds of Veeder-Root Standard and Special Counting and Computing Devices developed for every conceivable counting duty, in every field from atomics to electronics.

What do *you* need to count? Just write:

VEEDER-ROOT INCORPORATED
HARTFORD 2, CONNECTICUT

Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C.
Montreal 2, Canada • Dundee, Scotland
Offices and Agents in Principal Cities
"The Name that Counts"

STEEL
the Metalworking Weekly

SEPTEMBER 26, 1955
Vol. 137 No. 13

METALWORKING OUTLOOK, 63

The Editor's Views, 67

More Primary Aluminum Coming? 69
Harvey Machine Co.: Newest name among light metal producers

Plant & Equipment Outlays Recover, 71
Some $27.9 billion will be spent in 1955

Management at Work, 79
AS&R's Strauss: Journalist Turns Salesman

Hamburg: Shipbuilding Is Its Dish, 80
German port builds a world market

Metal Scaffolding Sales Soar, 81
Steel and aluminum rigs win 25 per cent of market

Windows of Washington, 76
Mirrors of Motordom, 83
The Business Trend, 87
Men of Industry, 91
New Products, 143
Behind the Scenes, 6
Letters to the Editors, 10
Calendar of Meetings, 27
New Literature, 156

TECHNICAL OUTLOOK, 111

New Glow in Blast Furnace Economy, 112
Ore sintering is a hot topic in steelmaking

Titanium Extrusion Ready for Planes, 115
Properties are excellent; scrap is minimized

More Life for Plating, 116
Clear organic coatings help win corrosion battle

Short Work on a Long Mill, 118
Eight automatics team up on 300-ft machine bed

Room To Swing a Molding Line, 140
New short-run aluminum foundry has that much and more

MARKET OUTLOOK, 159

Steel Operations, 159
Price Comparisons, 160
Nonferrous Roundup, 162
Nonferrous Prices, 164
Steel Prices, begin 166
Scrap Prices, 184

Editorial & Business Staffs, 16. Advertising Index, 188. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 W. 39th St., New York 18, N.Y.

Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, O. Subscription in the United States and its possessions, Canada, Mexico, Cuba, Central and South America, one year, $7.50; two years, $15; all other countries, one year, $20. Single copies (current issues), 50 cents. Metalworking Yearbook issue, $2. Accepted as controlled circulation publication at Cleveland.
Copyright, 1955, The Penton Publishing Co.

Recipes for RELIABILITY

There's no guesswork in the production of Seymour nickel silver, phosphor bronze and brass. Every step in their manufacture is prescribed—in detail—in a master quality control manual which is "the law" throughout Seymour casting shops and mills.

This is another reason why Industry has come to rely on Seymour to deliver nonferrous metals which are uniform in quality, year in and year out.

"Specify Seymour! You know it's good!"

NICKEL SILVER
PHOSPHOR BRONZE
BRASS

THE SEYMOUR MFG. CO.
SEYMOUR, CONN., U. S. A.

LOVEJOY

Variable SPEED PULLEYS

SELECT-O-SPEED TRANSMISSIONS

Save You Money

HERE'S WHY:

- ECONOMICAL IN COST compared to other variable speed transmission equipment. Simple in design but rugged in construction to give you long dependable service.
- EASILY INSTALLED on new or old equipment. Just as easy to operate. Finger-tip adjustment gives the right speed instantly.
- MAINTENANCE IS NEGLIGIBLE. No complicated mechanisms to get out of order. All parts can be readily inspected. Belts can be quickly adjusted or replaced.

Lovejoy Variable Speed Pulleys

are available in a complete range of sizes from fractional to 15 hp., ratios to 3 to 1.

Shown is a typical Lovejoy countershaft unit controlling speed of automatic spring coiler.

Lovejoy Select-O-Speed Transmissions

can be supplied with hand wheel or lever control. Fractional to 5 hp., ratios to 10 to 1.

This Lovejoy Select-O-Speed is used to control the speed of a printing press.

For your variable speed application, there is a type and size Lovejoy unit that will give you initial economy, dependable performance and long service life.

GET FULL DETAILS NOW!

Request Catalog

LOVEJOY FLEXIBLE COUPLING CO.

4871 W. LAKE STREET • CHICAGO 44, ILLINOIS

Mfrs. of Flexible Couplings, Variable Speed Pulleys and Transmissions, Motor Bases and Universal Joints.

behind the scenes

Consider the Cab Driver

When Bernard Baruch, or Robert Ruark, or Walter Winchell, or Herbert Hoover or anybody of any importance wants to find out what's going on in the world, whom does he ask? A cab driver, that's whom—and there's a stuffy bit of grammar for you. Did you know that "whom" came to us from the Middle English "wham," and that we've been stuck with it ever since because nobody with authority has ever been game enough to scuttle it?

Where were we? Oh, the cab drivers. Well, these men are alleged to be plenty sharp and observing; best of all, everything they know is yours for the asking: Instruction, information, opinion, philosophy, news—why, according to legend, there's no limit to the range of their understanding.

This preamble goes with the record, because Machine Tool Editor Bob Huber interviewed a pair of Chicago cab drivers during the recent Machine Tool Show. He implied that if the men mentioned in the opening paragraph had had the misfortune to seek advice from these particular Chicago cabbies, Baruch would have gone bankrupt; Ruark would have been fired; Winchell would have been sued; and Hoover would have recalled the findings of his commission.

Industrial Exhibits Spread

Those of you who attended the Chicago gatherings will recall that the Machine Tool Show was at the International Amphitheatre; the Production Engineering Show was at Navy Pier; the Machinery Show was at the Coliseum; and over at Soldier Field was General Motor's great display of power, called Powerama. Incredible sums of money had been spent to promote and publicize these shows, and on Sunday, Sept. 4, the first patrols of 200,000 visitors began to infiltrate the city. This was the situation when Huber climbed into a cab and inquired what was cooking in Chicago that week.

"Things are pretty dead, Mac," said the driver, artfully missing a Thunderbird that was obviously trying to play chicken with him. "There's some kind of a show going on, but I guess it ain't organized yet. Seems like they can't decide between Navy Pier, the amphitheatre or the stockyards. Some guys say it's at the Coliseum; some says it's at the pier. Know what I mean?"

Engineers, designers, metallurgists, market men, machinery specialists, manufacturers and buyers from all over the country began clogging Chicago thoroughfares toward the middle of the week, and once again Huber climbed into a cab. This time the driver was excited. Bob asked what the excitment was about.

"The town's full of nuts," explained the cabbie. "They all want to go everywhere at once. There's the biggest convention and show going on that you ever saw! It started at Navy Pier, but it got so big it spilled over into the amphitheatre, and then into the Coliseum, and now it's overflowing into Soldier Field!"

Huber was really impressed, "What crowd is it?" he asked.

The driver grudgingly relinquished a stolen lane to a bus, and turned a confidential stroke of the eye toward his passenger. "It's some sort of outfit like the millwrights. Biggest one in the world, too."

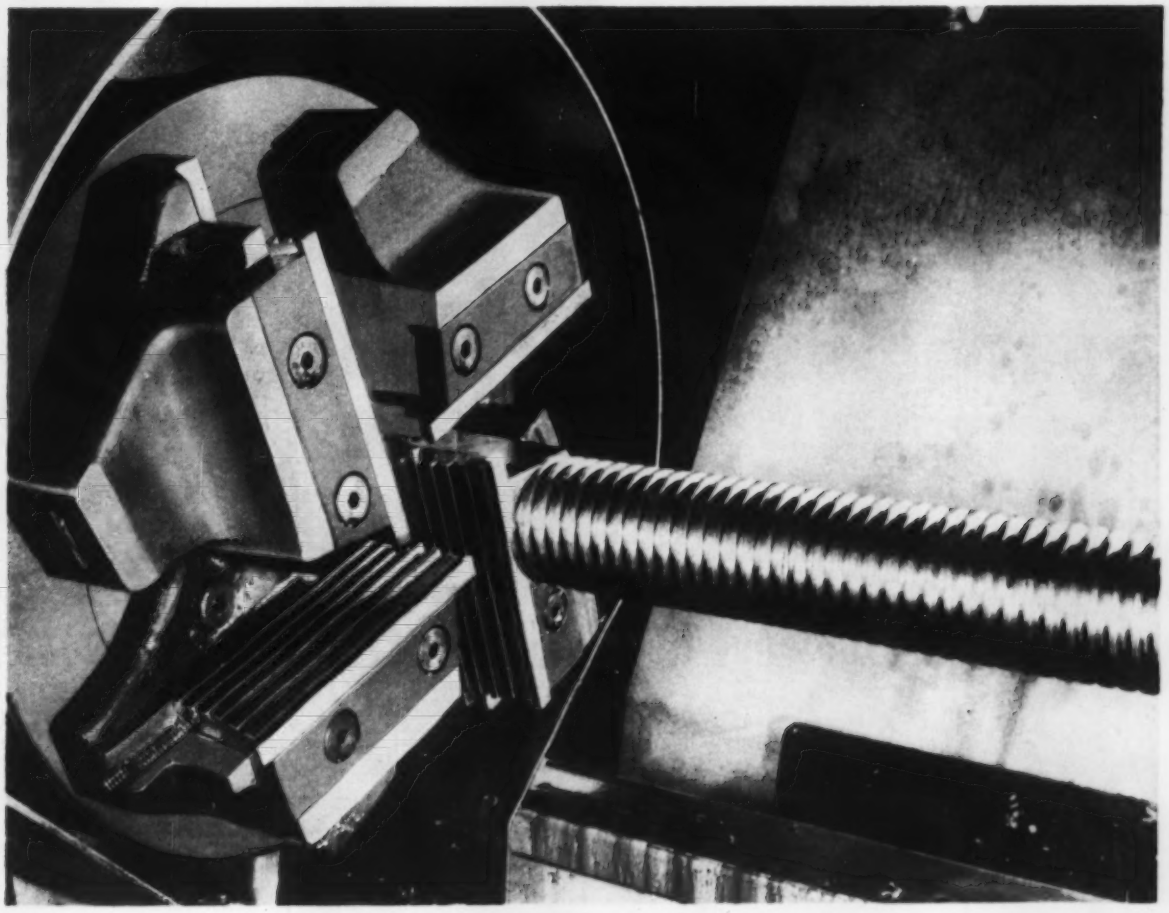
Special Award

Our guarantee of immunity and anonymity encouraged a small but peppery group of our readers to suggest personal candidates for a bust in the snoot. Remember Big Bill Thompson, the Chicago politician who vowed he was going to punch King George in the nose? Well, our vicarious punchers spared royalty this time, but they listed such persons as Harry Truman, Liberace, Uncle Milty, a former first sergeant, a traffic cop and the president of a company that had canceled a big order.

So much for the luxury of wishful thinking in the negative. How about the positive? Who (or Whom!), in your opinion, rates a special medal? And for what?

Shrdlu

(Metalworking Outlook—Page 63)



90% threading time saved on power screws

This large saving in the production of power screws at Rodney Hunt Machine Co. (Orange, Mass.) was made possible by the use of a LANDMACO Threading Machine.

Specifications require 2¾" diameter—2½ pitch Acme threads 56" long on cold-rolled steel. 5 hours had previously been required to complete the thread. Floor-to-floor threading time was cut to only 30 minutes after the installation of a LANDMACO 32C Single-Spindle Machine with a special 60" carriage travel.

Many features in the design of this equipment make it possible to do heavy duty threading to precision tolerances. Heavy construction and leadscrew feed assure accurate threading. Slippage of the work is prevented by an improved carriage front with 60% greater gripping power.

Massive construction of the 4" LANCO head and chaser-holders give maximum support to the chasers for the largest or smallest diameters. The tangential design of the chasers provides lateral absorption of cutting strains and free cutting action. Their roughing-and-finishing form assures threads of excellent finish in one pass, and the centering throats eliminate the out-of-roundness common in long workpieces.

This is but one example of the production economies to be derived from using LANDIS Equipment on large diameter threading. For additional information, please send specifications and ask for Bulletin #*H-45*.

413

LANDIS *Machine* COMPANY

WAYNESBORO · PENNSYLVANIA · U.S.A.

NEW

FRONT-TO-BACK CRANKSHAFT DESIGN

embraces numerous operating and structural improvements

Of far reaching importance, the development of Niagara's impressive, new Styleline Deep Throat Presses has opened the way to numerous operating and structural advantages. Barriers imposed by conventional side-to-side crankshaft arrangements and outmoded end wheel designs have been shattered. The Niagara-developed front-to-back crankshaft design introduces a new concept of deep throat press performance and economics:

MODERN, SPACE-SAVING, ENCLOSED CONSTRUCTION

The entire driving mechanism is within the limits of a compact, all-steel frame. There are no exposed, overhanging parts and mechanisms to obstruct crane service, block light, throw grease and consume floor space unnecessarily.

LONGER DIE LIFE, GREATER ACCURACY

Increased distance between gibs makes possible a wider slide (left to right) for greater support to wide dies. Longer gibs assure accuracy for the full stroke.

MINIMIZED SHAFT DEFLECTION AND GEAR WEAR

With all gears located inside the press frame and overhung bearings eliminated, damaging shaft deflection is held to a new minimum. Both pinion and gear are more rigidly supported to withstand maximum loading with minimum wear.

PROLONGED GEAR AND CLUTCH LIFE

Gears and clutch members, all neatly housed in the crown, operate in sealed baths of oil to assure longer service life.

Built in a large range of sizes and throat depths, these modern, Styleline Series C Presses reflect the latest thinking of Niagara engineers . . . today as always, pace-setters in power press advancement.

HERE'S THE WHOLE STORY ON WHAT THESE MACHINES CAN DO FOR YOU

Get all of the facts. Check the specs! Write for new, illustrated Bulletin 61 today. It will be mailed promptly without obligation.

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

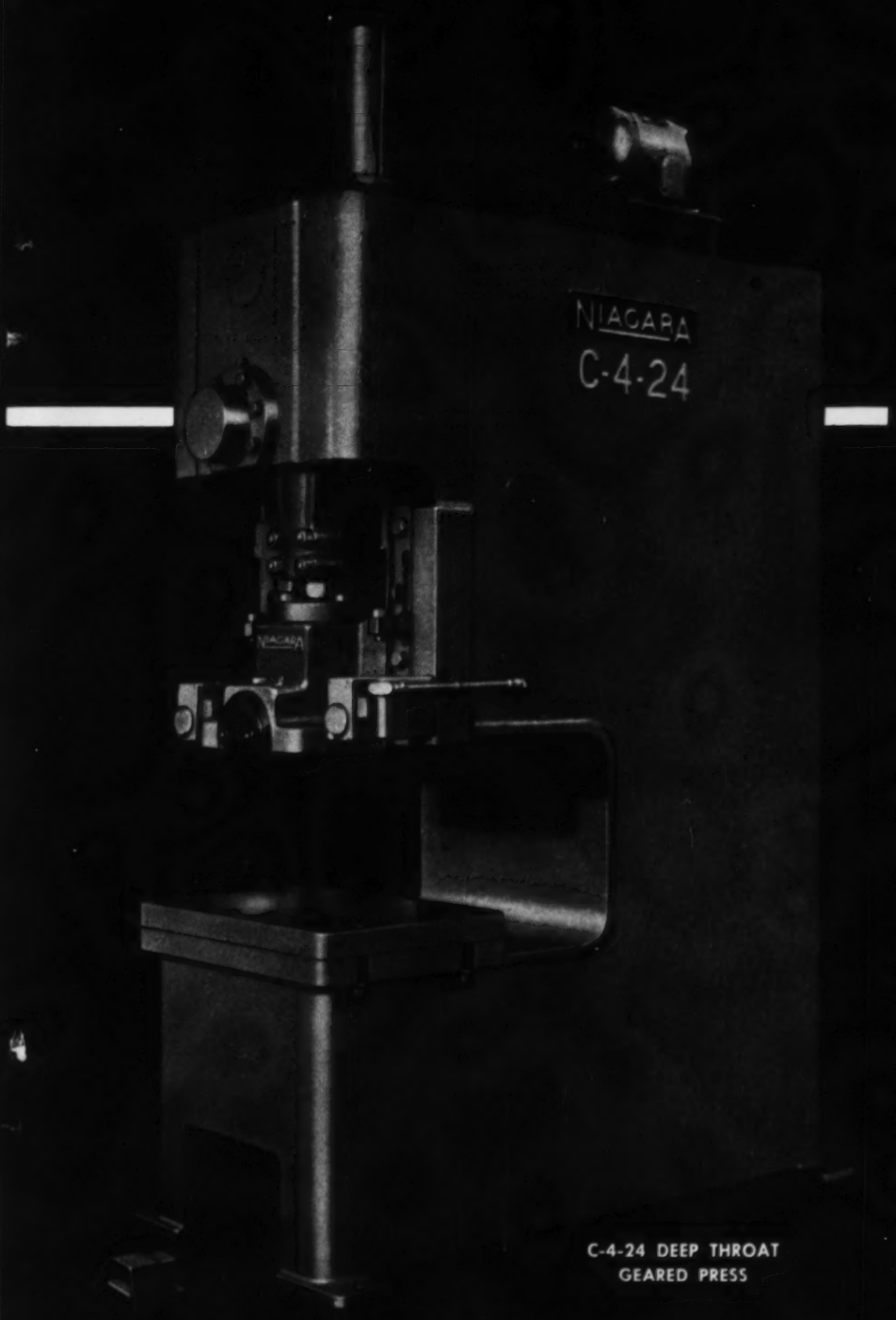
DISTRICT OFFICES:

Buffalo • Cleveland • Detroit • New York • Philadelphia

Dealers in principal U. S. cities and major foreign countries

NIAGARA

America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work



C-4-24 DEEP THROAT
GEARED PRESS

Air counterbalance offsets weight of slide, die and connections.

No overhanging motor, belts, flywheel, brake, shafts nor other mechanisms.

Front-to-back crankshaft (heavy, forged, high carbon steel) enables fully stylelined, enclosed construction.

Multiple V-Gibs assure maximum die life.

Unusually long slide and stiff channel section eliminate deflection of guiding ways, increasing die life. (J.I.C. flanged slides available.)

Large range of throat depths accommodates tremendous variety of work.

Rugged, all-steel, box type frames stress relieved in a furnace and grit blasted before machining.

Foot switch optionally available for clutch control.

Readily equipped with pneumatic die cushions for drawing operations.

Exclusive electro-pneumatic clutch on all geared models. Famous mechanical sleeve clutch on all plain, non-geared models.

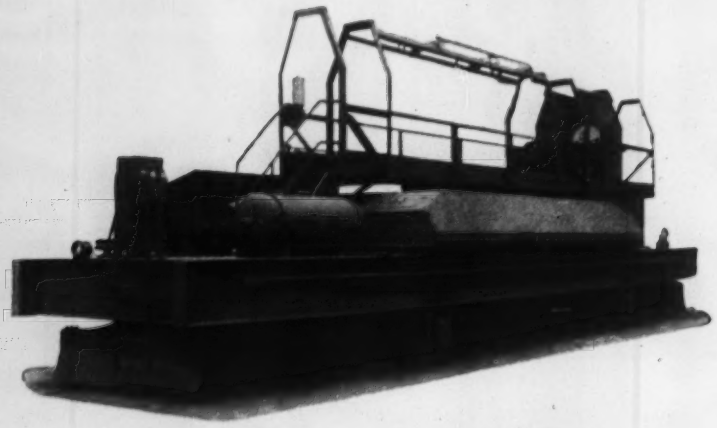
STYLELINE DEEP THROAT PRESSES

STOCK HOUSE OR HIGH LINE

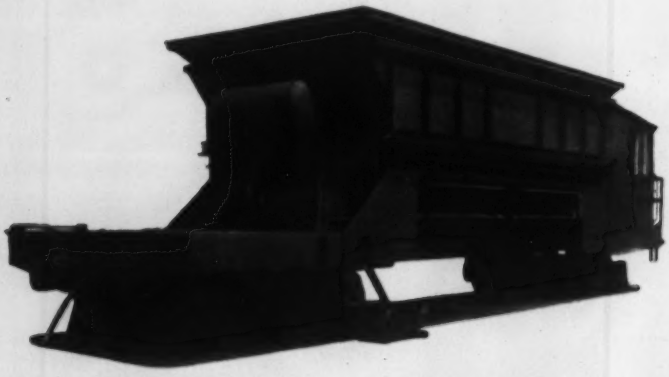
operators prefer the

DEPENDABILITY OF ATLAS CARS

These specially designed units are another example of the ruggedness of Atlas Cars. Their dependability helps maintain the most rigid furnace charging cycles.



40-TON SCALE CAR
Double Hopper Bottom Dump



75-TON ORE TRANSFER
Gable Bottom Double Side Dump

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS
TO THE EDITORS

Guides Are Washed Away

Can you furnish us with two copies of your *Specifications Handbook?* We lost ours during the flood.

O. F. Roy Jr.
Purchasing Agent
Billings & Spencer Co.
Hartford, Conn.

Our copy of *Guide for Steel Buyers* was lost in the flood. We would appreciate your forwarding a copy.

William D. Crosby
Purchasing Agent
Superior Electric Co.
Bristol, Conn.

• *They are being forwarded with our compliments.*

Photogenic, but Hazardous

In the article, "Big Sales in Small Holes," (Aug. 22, page 41), is an illustration of a girl working amid heavy machinery. She is decidedly photogenic, but it would seem that her hair might be a definite hazard as it is long and unconfined.

E. Kinietz
322 Kelker St.
Harrisburg, Pa.

Welding of Two Metals

We found your article, "Pearlitic Malleable: Casting for Tougher Jobs" (Jan. 10, page 62), interesting . . . particularly, the reference to the welding of pearlitic malleable to steel propeller shaft tubes. Could you refer us to sources for more information on this weldment?

Donald Zuerl
Danuser Machine Co.
Fulton, Mo.

• *Write Carl Joseph, Central Foundry Division, General Motors Corp., Saginaw, Mich. or Dr. W. K. Bock, manager-metallurgical research, National Malleable & Steel Castings Co., 10600 Quincy Ave., Cleveland, O.*

Steel in Special Shapes

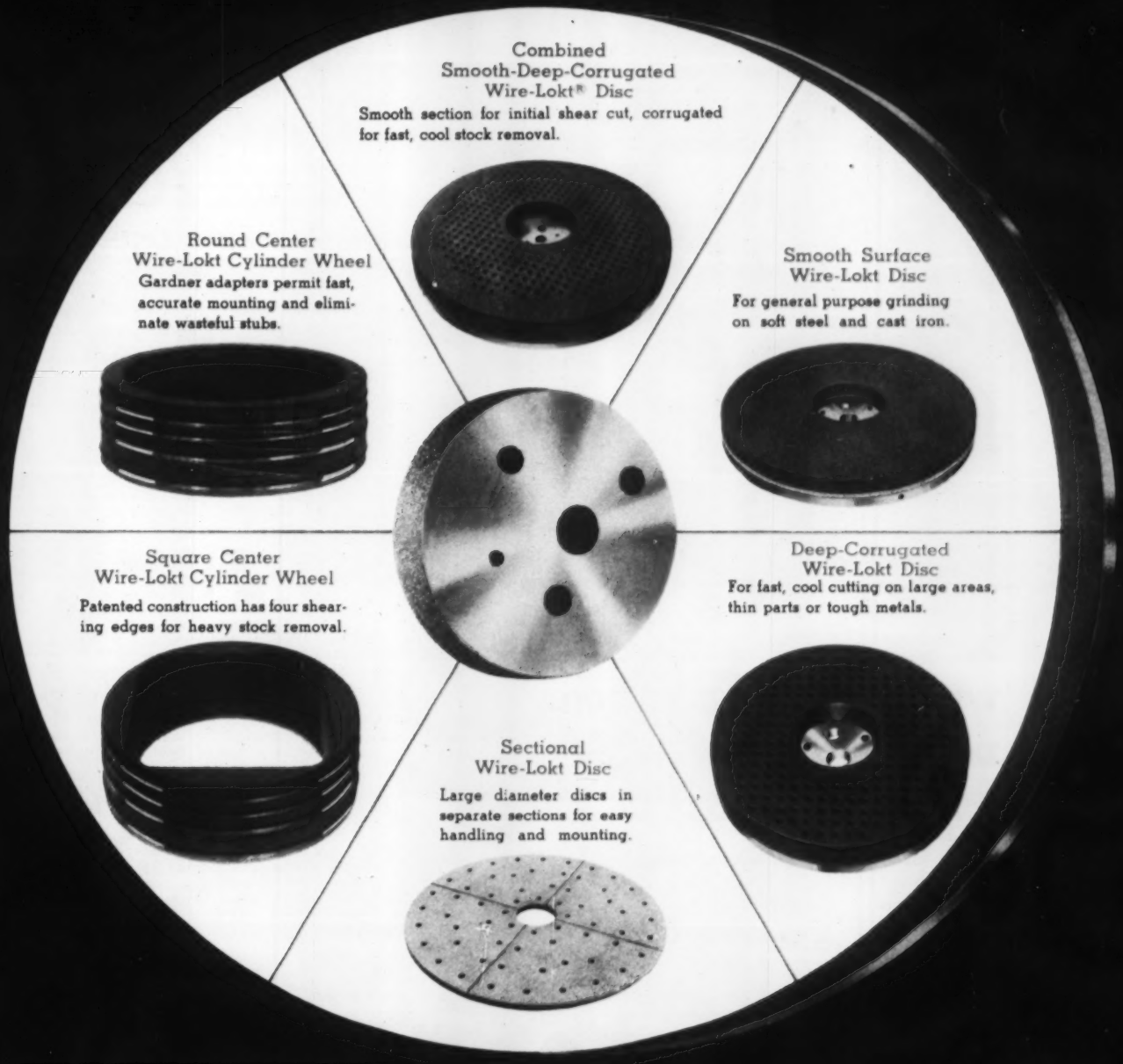
Upon the recommendation of local firms, we are writing you for the names of firms which supply cold-rolled steel in special shapes.

Zan Ballsun
Ballsun Co.
Los Angeles

• *We are unable to find any West Coast sources, but we suggest you contact these companies in the East: Van Huffel Tube Corp., Warren, O.; or Roll*

(Please turn to page 12)

6 Cost Cutting Abrasive Ideas to Cut Your Grinding Costs



Combined
Smooth-Deep-Corrugated
Wire-Lokt® Disc

Smooth section for initial shear cut, corrugated for fast, cool stock removal.

Round Center
Wire-Lokt Cylinder Wheel

Gardner adapters permit fast, accurate mounting and eliminate wasteful stubs.

Smooth Surface
Wire-Lokt Disc

For general purpose grinding on soft steel and cast iron.

Square Center
Wire-Lokt Cylinder Wheel

Patented construction has four shearing edges for heavy stock removal.

Deep-Corrugated
Wire-Lokt Disc

For fast, cool cutting on large areas, thin parts or tough metals.

Sectional
Wire-Lokt Disc

Large diameter discs in separate sections for easy handling and mounting.

116A

- Wire-Lokt Safety Construction
- Tailored to Your Grinding Needs
- Bonds for Wet or Dry Grinding
- For All Standard Types of Mounting
- Nation-wide Abrasive Engineering Service

Your local Gardner Abrasive Man is ready to help you. Write and we will have him call at your plant.

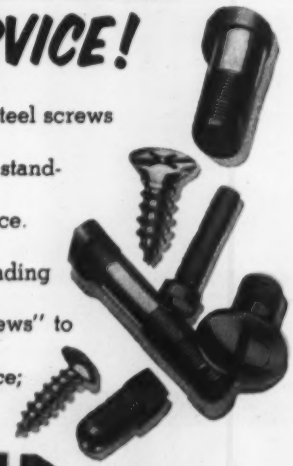
GARDNER

abrasive discs

BELOIT, WISCONSIN

WE'RE RIGHT "NEXT DOOR"
IN TERMS OF SERVICE!

. . . and when you want stainless steel screws or high-tensile alloy fasteners . . . standard or special . . . try FERRY service. You would expect the "world's leading manufacturer of stainless steel screws" to have an edge in quality and service; WE HAVE.



The E. W. FERRY SCREW PRODUCTS Inc.
Smith Road, Brookpark, Cleveland 30, Ohio

LETTERS

(Concluded from page 10)

Formed Products Co., 3766 Oakwood Ave., Youngstown, O.; or Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.

Why Customers Are Lost

We would like 25 copies of the article, "What Price Cost Fighting?" (July 25, page 41). We also are interested in getting more information on the American Gear Co. survey on why customers are lost. Who can give us this data?

Otto R. Kovacs
Assistant Advertising and Sales Promotion Manager
Raybestos-Manhatttn Inc.
Manhattan Rubber Division
Passaic, N. J.

• *The survey was made by Workman Service Co., 731 S. Spring, Los Angeles, Calif.*

Target for Unions

May we have six tear sheets of the article, "Office Workers: Major Target for Unions" (Aug. 22, page 35)? The Colorado Engineering Council and its constituent engineering organizations have a committee which will be vitally interested in this article.

C. C. Drake
Plant Superintendent
Griffin Wheel Co.
Denver

Chemical Perforates Well Pipe

In the Technical Outlook of Aug. 22 (page 67), we note an item indicating that a chemical method of perforating steel pipe in wells has been developed. We would appreciate knowing to whom we can write for more details.

G. F. Briggs
Field Engineer
Edward E. Johnson Inc.
St. Paul

• *Write McCullough Tool Co., P. O. Box 2575, Houston 1, Tex. or Pennsylvania Salt Mfg. Co., 3 Penn Center Plaza, Philadelphia 2, Pa.*

Address of ACME

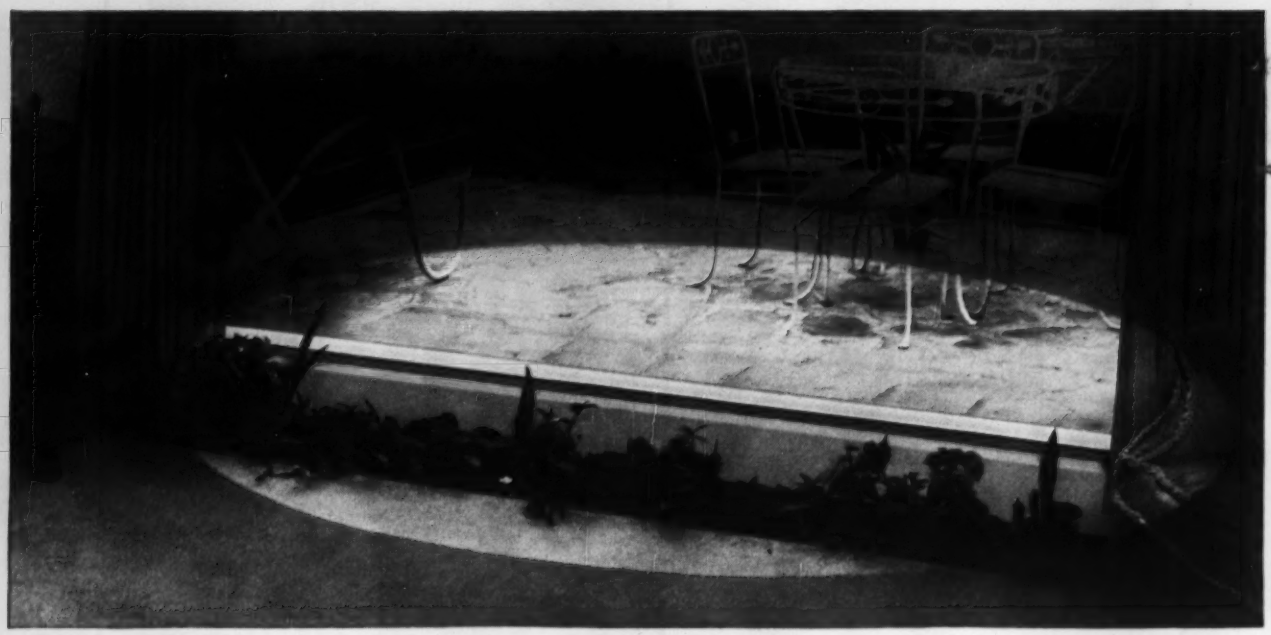
In the Aug. 15 issue, the exceptionally interesting and informative article, "Business Consultants: Their Uses and Limitations," appeared. In it is mentioned the Association of Consulting Management Engineers (ACME). I would appreciate its address, so that I can write for information about its activities.

Lawrence F. Megow
3342 Arbor St.
Houston

• *Write it at 347 Madison Ave., New York 17, N. Y. Philip Shay is executive secretary.*

DESIGN YOUR PARTS OF SPRING STEEL
LIGHT WEIGHT LONG WEARING STRONG
Wallace Barnes
Spring Steel
ANNEALED
TEMPERED
Meets every requirement for modern product design and fabrication. Excels in accuracy, ductility hardenability, finish, high fatigue value, and uniformity.
Wallace Barnes Steel Division
WALLACE BARNES COMPANY • Bristol, Conn.
DIVISION OF ASSOCIATED SPRING CORPORATION

General Automatic solves a "hot" Republic Electro



General Automatic Products Incorporated, Baltimore, Md., a manufacturer of baseboard radiation for the home, embodies a snap-lock design in its units which involves exceptionally severe roll-forming in 22-gage steel sheets.

Since these units must take a high-quality painted finish, it's extremely important that the surface of the metal is in no way damaged during the forming operation.

To solve this problem, General Automatic Products uses Republic Electro Paintlok—the zinc-plated steel sheet that is chemically treated to take paints, lacquers, synthetic enamels and hold them for years, even under hard service.

One of the important advantages of Electro Paintlok is the ability of its zinc coating to remain absolutely tight during bending, rolling, punching and shearing operations—with no fracturing, no cracking, no peeling or flaking.

There are other money-saving advantages, too. The entire finishing operation is speeded because Electro Paintlok requires no costly cleaning before painting. Only the removal of finger marks, fabricating oils, and warehouse dust is necessary. Surfaces are pre-conditioned. No pre-etching is required.

REPUBLIC STEEL CORPORATION
3120 East 45th Street
Cleveland 27, Ohio

REPUBLIC STEEL

Please send more information on:

- ☐ Republic Electro Paintlok Steel
- ☐ Free-Machining ENDURO®
- ☐ Steel and Tubes Fabricating Facilities
- ☐ ENDURO Stainless Steel

Name_____ Title_____

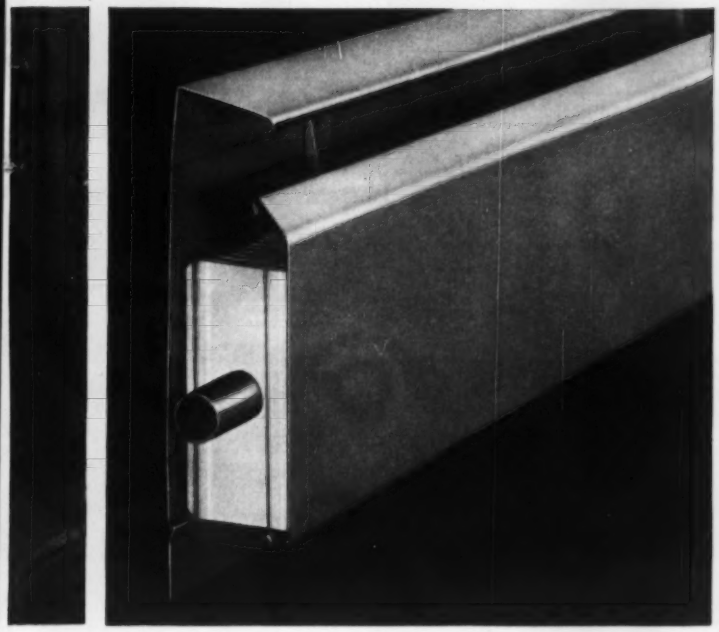
Company_____

Address_____

City_____ Zone____ State_____

K-9787

problem with Paintlok



And, when sheets are held in stock for long periods under approved warehousing conditions, the tight zinc coating protects against rust and corrosion.

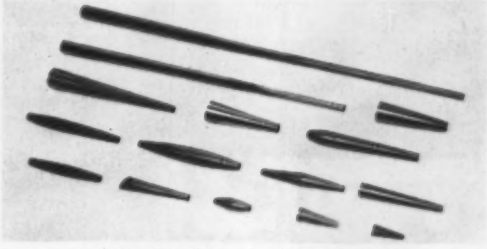
If you have a painted or enameled steel product that needs to look better longer, it will pay you to get the full story on Republic Electro Paintlok. Send coupon for Booklet 655 today.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

Republic specializes in solving problems

WHERE DEEP DRAWING IS DESIRABLE to avoid the high cost of successive draws, Republic ENDURO Stainless Steel is ideal. Its high ductility and elongation makes it possible to deep-draw a circular blank in one stamping operation with less danger of tearing or fracturing. Bonus advantages built into the washing-machine tub shown above include added strength, better appearance and a lifetime of corrosion resistance. Republic metallurgists and engineers will give you free assistance on applications, processing and uses of Republic ENDURO Stainless Steel. Send coupon for facts.



IF MATERIAL COSTS ARE HIGH ON TUBULAR PARTS, it may pay you to use Republic ELECTRUNITE Mechanical Steel Tubing. These lamp parts, display stand legs and furniture legs were previously made of cast brass, bronze, white metal or heavy-gage tubing. Using light-gage ELECTRUNITE effected substantial weight savings ...plus the desired strength and appearance. One of the above tapers reduces ELECTRUNITE Tubing from 1½″ O.D. to ¾″ O.D. in a 6″ length without metal fracture. If you use tubing for long or short tapers, send coupon for facts on ELECTRUNITE.

IF STEEL PART PRODUCTION RATES ARE LOW, UNIT COSTS HIGH, you can solve the problem with free-machining ENDURO Stainless Steel Bars. They'll machine beautifully at every station on your automatics—and at rates up to 90% of Bessemer screw stock. And you'll get the added strength, appearance, and heat- and corrosion-resistant qualities of stainless steel. Republic ENDURO Stainless is available in cold-finished and hot-rolled bars, special sections and wire. For more information, mail coupon.

WHEN IT'S
***Special* BOLTS**
***and* STUDS**

Send your Specifications to

ERIE

40 years' experience in making special bolts, studs, nuts for specific job requirements.

10 INTEGRATED COMPANIES
BARIUM
STEEL CORPORATION
WORKING IN STEEL, ALUMINUM MAGNESIUM, FIBERGLASS

REPRESENTATION IN PRINCIPAL CITIES

STEEL
The Metalworking Weekly

Editor, IRWIN H. SUCH
Managing Editor, WALTER J. CAMPBELL
Assistant Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY ..... *Market Editor*
J. D. KNOX ..... *Steel Plant Editor*
HARRY CHANDLER ..... *Copy Editor*
ALLEN G. GRAY ..... *Technical Editor*
ROBERT F. HUBER ..... *Machine Tool Editor*

FRANK R. BRIGGS ..... *Associate Editor*
THOMAS F. HRUBY ..... *Associate Editor*
JAMES P. MORRISSEY ..... *Associate Editor*
ROBERT O. JAYNES ..... *Associate Editor*
VAN CALDWELL ..... *Associate Editor*

AUSTIN E. BRANT ..... *Assistant Editor*
MICHAEL A. L. WEBSTER ..... *Assistant Editor*
STANLEY B. STEWART ..... *Assistant Editor*
BYRON E. KENNEL ..... *Assistant Editor*
A. DONALD POSTMA ..... *Assistant Editor*
H.-H. VON KOSCHEMBAHR ..... *Assistant Editor*
MARY T. BORGERHOFF ..... *Assistant Editor*
MARY ALICE LYMAN ..... *Assistant Editor*

JEAN MCNAMEE ..... *Editorial Assistant*
EILEEN CORTES ..... *Editorial Assistant*
MARY ANN STUVE ..... *Editorial Assistant*

Resident Editors

New York 17 ..... 60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
Murray Hill 2-2581

Chicago 11 ..... 520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 ..... 2837 Koppers Bldg.
ROBERT M. LOVE
Atlantic 1-3211

Detroit 26 ..... 1249 Washington Blvd.
FLOYD G. LAWRENCE
Woodward 3-3488

Washington 4 ..... 1123 National Press Bldg.
E. C. KREUTZBERG
Executive 3-6849

London, 2 Caxton St., Westminster S. W. 1
VINCENT DELPORT
European Editor

Editorial Correspondents

Birmingham ..... R. W. KINCEY
Birmingham 3-1121

Buffalo ..... L. G. FELDMANN
Cleveland 5353

St. Louis ..... MAC L. HUTCHENS
Republic 7752

Youngstown ..... GEORGE R. REISS
Riverside 7-1471

Los Angeles ..... NORMAN LYNN
Webster 5-3040

San Francisco ..... EDWIN HAVERTY
Yukon 6-5151

Seattle ..... R. C. HILL
Melrose 1895

Cincinnati ..... JACK DUDLEY
Beechmont 7598

Toronto, Canada ..... F. S. TOBIN
Empire 4-9655

Birmingham, England ..... J. A. HORTON

Paris, France ..... LEON JAUDOIN-PROM

Liege, Belgium ..... JACQUES FOULON

Dusseldorf, Germany ..... DR. HERBERT GROSS

BUSINESS STAFF

Advertising Director ..... H. G. ROWLAND
Advertising Service Mgr. ..... DORIS MITCHELL
Production Manager ..... A. V. ANDERSON
Circulation & Promotion Dir. ..... S. F. MARINO
Circulation Manager ..... G. R. EBERSOLE
Marketing Director ..... D. C. KIEFER
Market Research Dir. ..... N. R. LADABOUCHE
Direct Mail Service ..... AMY LOMBARDO
Reprints ..... JUNE SCHILENS
Classified Advertising ..... BETTY MARKWORTH

Advertising Representatives

New York 17 ..... 60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Philadelphia ..... 200 Wynnewood Ave.
Wynnewood, Pa.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. ..... 12 Farmstead Lane
CALVIN FISHER JR.—Orchard 7-1756

Rochester, N. Y. ..... 217 Ridgeview Dr.
East Rochester, N. Y.
HAROLD A. DENNIS—Browning 2105

Pittsburgh 19 ..... 2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 ..... Penton Bldg.
J. K. GILLAM, WM. J. D'ALEXANDER
Main 1-8260

Cincinnati 6 ..... 2215 Victory Pky.
E. L. FRANKE—Parkway 1-3640

Detroit 26 ..... 1249 Washington Blvd.
C. A. TALLINGER JR.—Woodward 3-3488

Chicago 11 ..... 520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
JOHN W. VAUGHAN
Whitehall 4-1234

Los Angeles 48 ..... 6262 Commodore Sloat Dr.
F. J. FULLER—Webster 1-6865

San Francisco 4 ..... 57 Post St.
F. J. FULLER, Robert W. Walker Co.
Sutter 1-5568

Griffin, Georgia ..... 331 S. 12th St.
FRED J. ALLEN—Griffin 7854

BPA

NBP

Published Every Monday by
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, O.
MAin 1-8260

G. O. HAYS ..... *President and Treasurer*
R. C. JAENKE ..... *Executive Vice President*
F. G. STEINEBACH ..... *Vice President and Secretary*
F. O. RICE ..... *Vice President*
J. P. LIPKA ..... *Asst. Secy. and Asst. Treas.*

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION

Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors and National Business Publications Inc.

Production Pointers from GISHOLT

TIME-SAVING IDEAS

Presented as a service to production men, we hope some of these interesting ideas, chosen from thousands of jobs, will suggest ways to help cut time and costs in your own work.

HOW SPECIAL TOOLING SIMPLIFIES MACHINING OF STEEL DRIVE SHOES

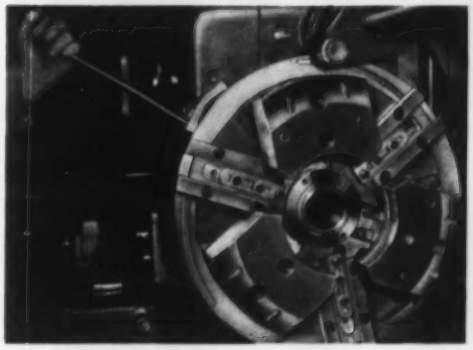
Extra Chucking Eliminated with Smart Setup on Gisholt 2L Saddle Type Lathe

Sharpest thing about this "pointer" is the chucking arrangement to hold the part away from the chuck face to permit back facing and forming operations at the rear of the workpiece. Parts are 5″, 6″ and 8″ steel drive shoe forgings.

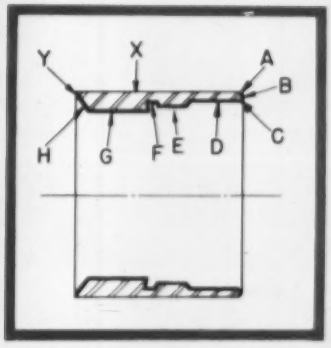
Workpieces are accurately located by means of retractable chuck jacks, which are mounted on special slides and actuated by a special cam plate on the chuck O.D. To chuck the part, a slight rotation of the cam plate causes the jacks to move in and work is placed against them at Y while chucking pressure is applied at X. (See drwg.) The jacks are then moved out to clear the part for machining. Extra-wide chuck jaws with driving pins center the part and distribute chucking pressures to avoid distortion.

Piloted tools on turret stations 1 and 2 rough and finish bore D-E-G and rough and finish form A-B-C. Special internal facing tools are mounted on the next three turret stations. These tools are actuated by feeding against a stop bracket mounted on the overhead pilot bar. F is formed from station 3; H is backfaced from station 4, and H is then formed from station 5. A collapsible tap, mounted on station 6, operates in conjunction with the turret threading attachment to thread E and finish the part. Floor-to-floor time on the 6″ size drive shoe is only 7.9 minutes.

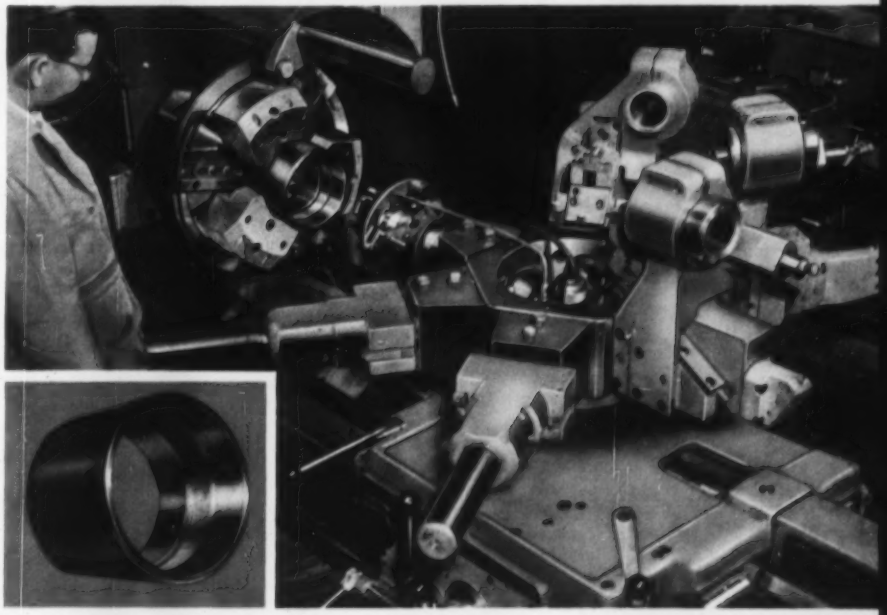
Smart tooling arrangement makes it possible to complete each part in single chucking, including back-facing, forming, threading.



Special cam plate to actuate retractable chuck jacks.



Drawing indicates surfaces machined.



Tooling setup shows station #6 in working position with collapsible tap ready to finish part. Inset shows finished drive shoe.

GISHOLT

TIME-SAVING IDEAS

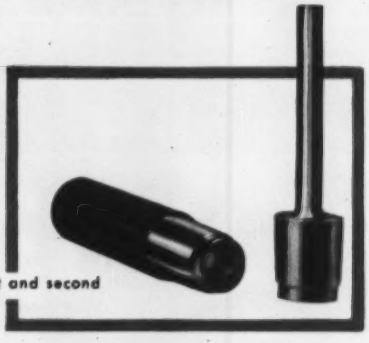
THIN-WALL PARTS EXPERTLY HANDLED WITH THIS SMART SETUP

Hex Turret on Ram Type Lathe Is Tooled for Double Operation to Minimize Tool Change-Over

With this setup, floor-to-floor and change-over time are held to an absolute minimum.

Machining thin-wall parts—like this ¼" hollow drill—is always a ticklish problem. Here's how a leading producer is handling it in two fast operations, with a Gisholt No. 3 Ram Type Turret Lathe.

First operation: advance rough bar stock end 1½" from face of collet and chuck. Form O.D. and face end with form tool in rear tool post. Start drill from hex turret. Rough and finish drill bore with special pivoting tool holder—which carries both drills and mounts on single turret station. Ream bore. Then open collet, advance stock to length, re-chuck, and cut off from front tool post.

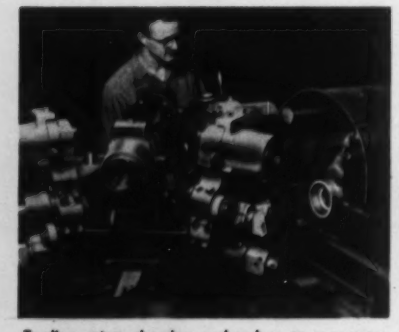


Workpiece, after first and second operations.

For change-over, insert special collet pads with built-in locating stops. Mount rear tool post with chamfer tool; place radius tool in front tool post. With hex turret tooling already in place and stops set, change-over is at minimum.

Second operation: Place piece in special collet; locate and chuck. Center end from hex turret. Chamfer end from rear tool post to provide accurate start for roller turners which reduce stock O.D. to ¼" in three passes. Form shank end radius, and the part is completed.

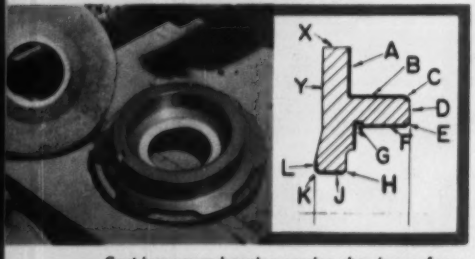
Only 3.6 minutes floor-to-floor time for the first operation and 1.3 for the second—that's ample proof that this kind of tooling pays off.



Tooling setup, showing pusher bar on rear cross slide, with slide tool in foreground.

SLIDE TOOLS STRADDLE FACE TO COMPLETE PART IN ONE CHUCKING

Pusher Arrangement on Fastermatic Handles Internal Machining, Back-Facing



Cast iron worm bearing carrier, showing surfaces machined, front and back, in this operation.

Ordinarily, tooling up for this cast iron worm bearing carrier would indicate several chuckings—but with this setup on the 2F Fastermatic Automatic Turret Lathe, one chucking is all that's required. A 3-jaw air chuck holds the work at X, with location against the backface Y.

Here's the machining operation: tools on turret station 1 rough turn B, and rough bore F and J, while tools on front and rear cross slides rough and finish face A. Next, a pusher rod on the rear cross slide actuates a slide tool on turret station 2, which carries tools to face and relieve G, chamfer H and rough face L. B is semi-finished turned from station 3, which also chamfers C and semi-finish bores F and J. Station 4 then finish bores F and chamfers E; another slide tool on station 5 finish faces L and chamfers K; station 6 finish turns B and finish bores J—and the part is completed—in a single automatic operation!

Here's steady low-cost production. Since the operator merely loads, starts and unloads the Fastermatic, he can easily handle two or more machines at the same time.

With this well-planned setup, 12 surfaces are machined in one fast, automatic operation, requiring only 4.4 minutes, floor-to-floor.

GISHOLT

TIME-SAVING IDEAS

SPIN TUBS FOR AUTOMATIC WASHER BALANCED FOR SMOOTHER OPERATION

DYNETRIC Balancer Handles Unusual Assemblies in Overhanging Position; Simplifies Loading and Unloading

Here's a tip on how unusual assemblies can be handled—for either single or two-plane balancing operations—in an overhanging position on the same machine.

In the illustration, two different models of automatic washer spin tubs are shown. A and B represent a model designed for single plane balancing. C and D represent a model with a balancing ring added to the base, permitting two-plane balancing.

Using the Type 3S DYNETRIC Balancing Machine, the parts are mounted on an arbor which is never removed from the work supports. This simplifies loading and unloading. The parts are then balanced in an overhanging position, with the arbor counterweighted at one end to keep the center of gravity of the rotating assembly between the supporting bearings. Adequate hold down is assured by a full bearing on the left work support.

For tubs A and B, the operator uses one switch to indicate location and amount of unbalance for the single correction plane. For tubs C and D, two switches are used—one for each plane. Bolts, washers and nuts are used for correction—applied around the large diameter near the top of A and B, and in the two pre-selected correction planes illustrated for C and D. Each tub is rotated again for final check, and the job is done.

The Gisholt DYNETRIC Balancing Machine simplifies handling of unwieldy parts—provides single or two-plane balancing, even with assemblies in overhanging position.

DYNETRIC BALANCERS GISHOLT

For two-plane balancing on C and D, weights are applied in two pre-selected correction planes.

For complete information and additional job applications, write for your free copy of the new Gisholt Type "S" Balancing Machine Catalog—ask for Form 1165-A.

Either single or two-plane balancing is accommodated by the versatile DYNETRIC Balancing Machine.

BEARING RACE PRODUCTION SPEEDED UP WITH NEW SUPERFINISHING MACHINE

Both Inner and Outer Races Handled in Minimum Time

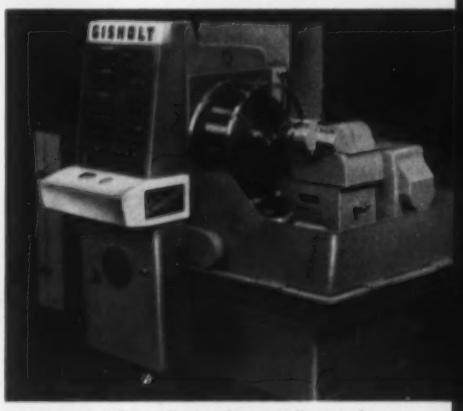
Here's how this manufacturer is increasing bearing race production (and bearing life) through the new Gisholt Model 79 Superfinishing Machine.

Providing maximum versatility, the new machine Superfinishes bearing tracks on inner and outer bearing races, and handles either straight or tapered bores of inner bearing races. The workpieces are Superfinished from a ground surface down to 3 to 5 micro inches RMS or less. For loading and unloading, the Superfinishing quill unit "tilts" away from the face of the 16" magnetic chuck. The quill unit is adjustable longitudinally, angularly, and for work diameters ranging from 1¼" O.D. to 15" I.D. or O.D.

The inner bearing race on the chuck has a $3^{13}/_{16}$" O.D., and is Superfinished in 35 seconds floor-to-floor.

For high production Superfinishing of inner and outer bearing races, nothing beats the new Gisholt Model 79 Superfinishing Machine.

Typical Superfinished parts handled on this high production equipment.



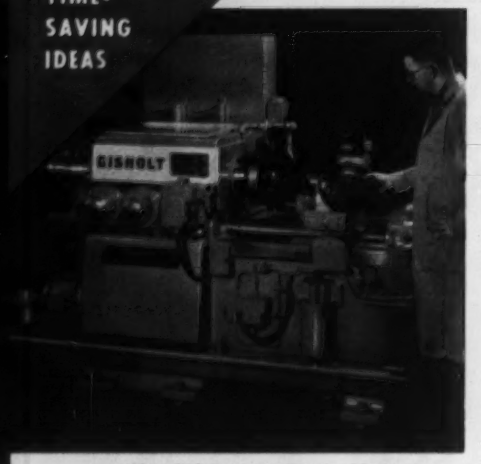
Dial controls independently adjust spindle speed, oscillation rate, travel and time for roughing and finishing cycles.

GISHOLT

TIME-SAVING IDEAS

UNIQUE SETUP FOR DOING TWO JOBS IN ONE CHUCKING

Automatic Lathe Machines and Superfinishes Brake Drum in One Automatic Operation



New Gisholt MASTERLINE No. 12 Automatic Production Lathe, tooled to machine and Superfinish brake drum.

Production men—always looking for ways to combine operations, reduce handling and save money—will be keenly interested in this tooling setup.

Using the new MASTERLINE No. 12 Automatic Production Lathe, the brake drum is chucked through the small bore on an air-operated draw-back type fixture. The operator clamps a vibration dampener around the O.D. and pushes the "start" button to begin the automatic cycle.

The I.D. is finish bored from the front carriage, which then tips toward the spindle centerline and relieves the boring tool. Then a Gisholt No. 2 Superfinishing Attachment—mounted on the rear independent slide—is fed into position. The brake drum I.D. is Superfinished from a turned surface down to 25 to 30 micro inches RMS. F.t.f. time is a short 1.5 minutes.

Handling is reduced; closer tolerances are held, and the finished product improved by combining machining and Superfinishing on a MASTERLINE No. 12 Automatic Lathe.

Write today for Advance Data Booklet No. 1175 for complete information on Gisholt MASTERLINE No. 12 Automatic Lathe; Booklet No. 1177 for No. 12V.

RING GEAR PRODUCTION PROBLEMS SOLVED THROUGH SPECIAL TOOLING

Alignment Concentricity and Fine Finish Simplified by Simplimatic Automatic Lathe

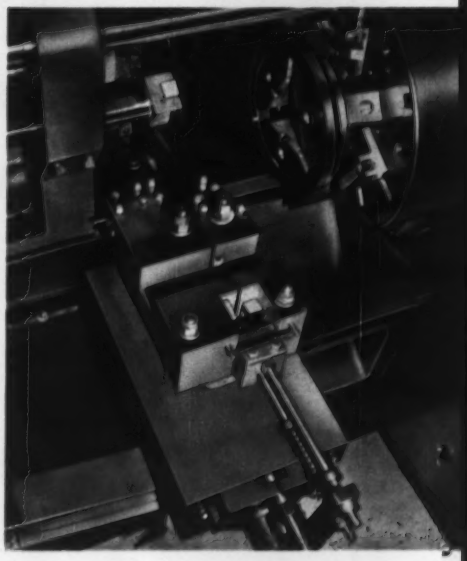
Maybe there's an idea for you in the way this manufacturer solved some tough tooling problems with the right kind of setup.

The part, a steel final drive gear forging, had to have both front and rear faces perpendicular to the bore. Distortion through chucking pressures had to be absolute minimum. Location had to be accurate against dead stops, yet the back face had to be machined. No tool tracks could be left on front and back faces.

Every problem is licked through this smart tooling on a Gisholt Simplimatic: to equalize chucking pressures, avoid distortion and simplify alignment; swivel-type pie-shaped jaws chuck the work in the previously machined I.D. Maximum rigidity is assured through twin overhead pilot bars on a special boring head on the center slide. Clearance for straddle-facing and chamfering operations is provided by swinging jacks on the chuck face, which permit accurate location and swing out of the way. Tool tracks are eliminated by a special wedge-type tool relief arrangement on the rear slide. To bring the facing tools together, the wedge is engaged during the cut—then withdrawn to let the tool blocks spring apart for tool relief.

Floor-to-floor time? The job is completed in just 2.8 minutes.

Smart tooling plus the versatility of the Simplimatic eliminated many special problems in machining this final drive gear forging.



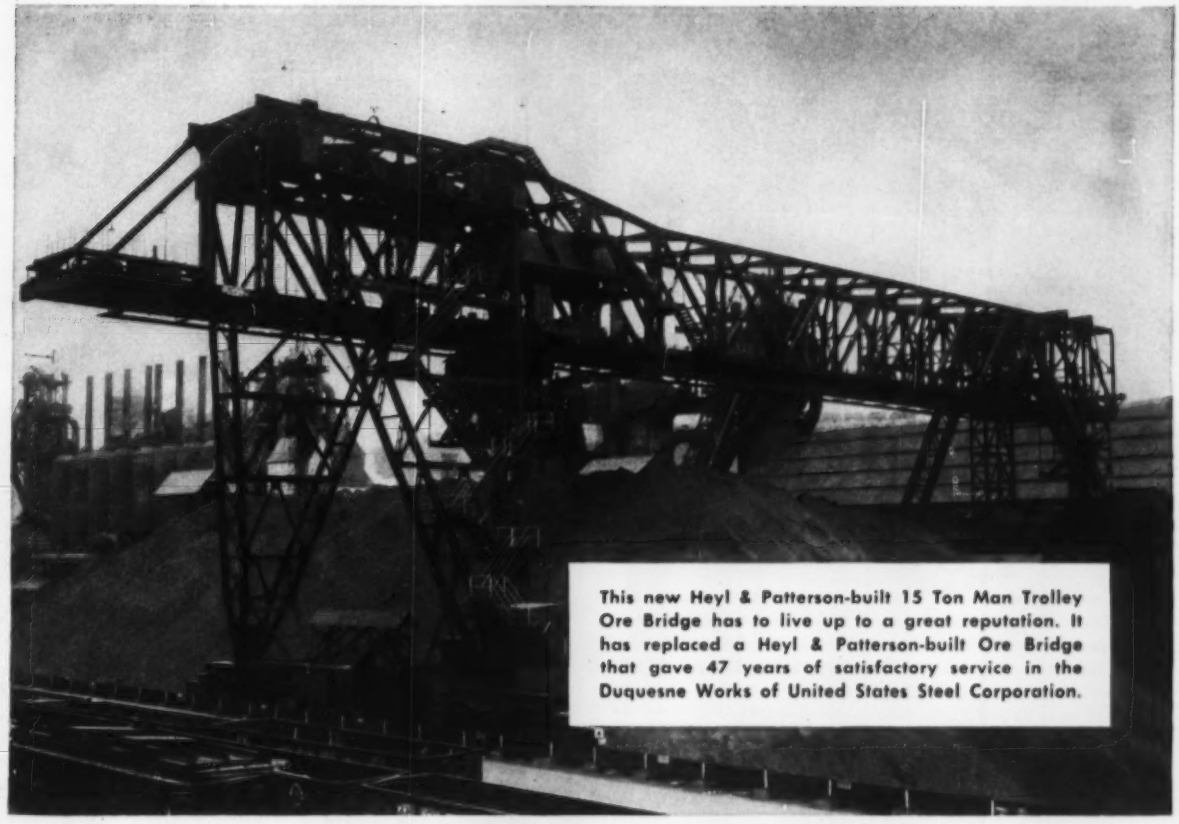
Close-up of workpiece and tooling. Note wedge-type tool relief arrangement on rear slide.

No. 9—1055
642

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



This new Heyl & Patterson-built 15 Ton Man Trolley Ore Bridge has to live up to a great reputation. It has replaced a Heyl & Patterson-built Ore Bridge that gave 47 years of satisfactory service in the Duquesne Works of United States Steel Corporation.

Heavy Materials-Handling Equipment

Specially Engineered For Your Requirements

"All the Way from Design to Satisfactory Operation" is a time-tested plan wherein each essential function from design to successful operation is performed by one organization.

The successful application of this plan of operation has developed a spirit of teamwork on the part of the Heyl & Patterson engineering, production (structural and machine shops) and erection departments.

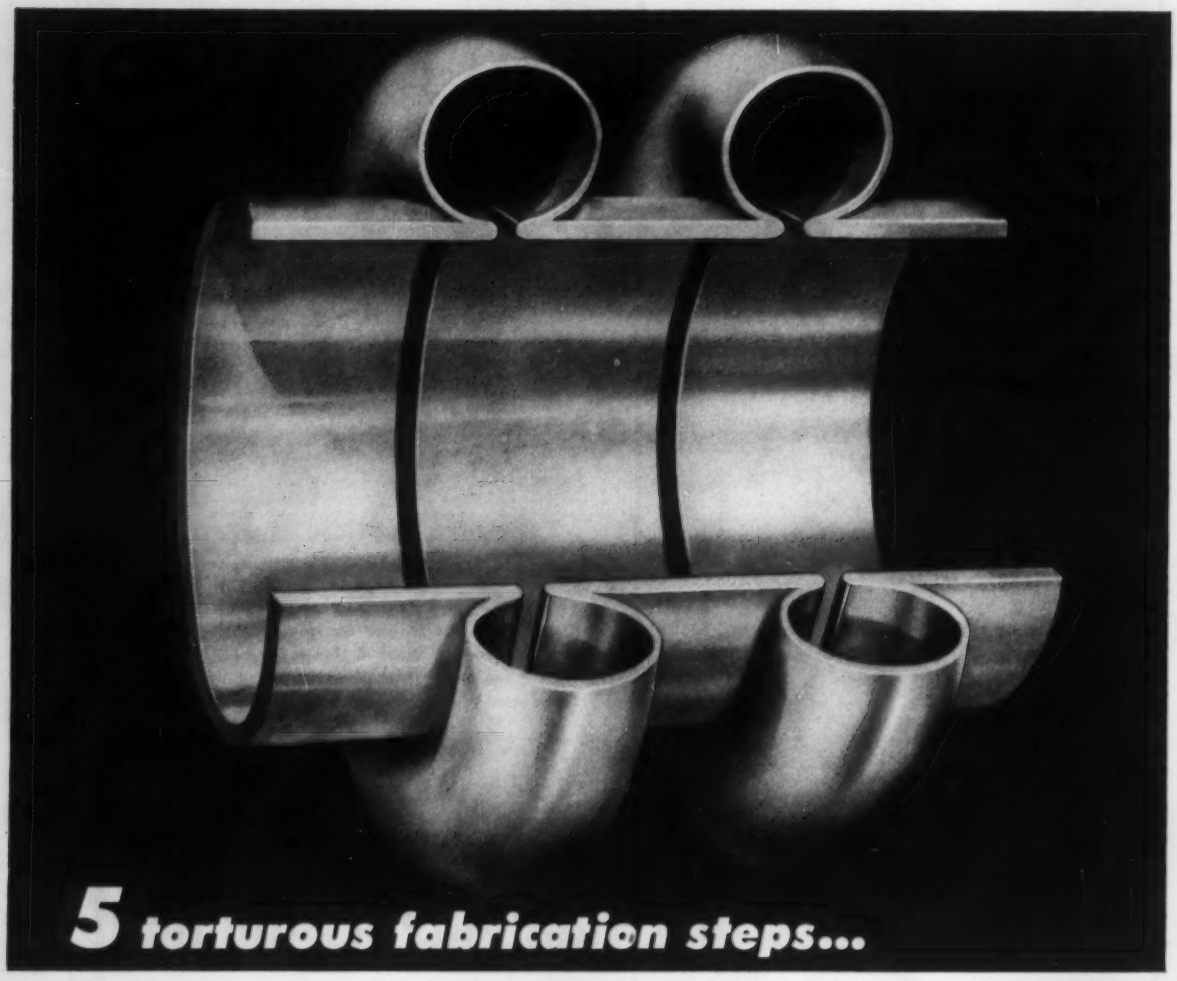
This teamwork makes possible the execution of our contracts for Heavy Materials-Handling Equipment with assurance of satisfaction to our customers.

- **Ore & Coal Bridges**
- **Rotary (and other types of) Car Dumpers**
- **Boat Loaders & Unloaders**
- **Conveying Systems (Coal, Coke & Ore)**
- **Sintering Machines & Plants**
- **Pig Casting Machines**
- **Bradford Breakers**
- **Thorsten Sampling Equipment**
- **Liquid Cyclones**
- **Rail Clamps & Buffers**
- **Reineveld Centrifugal Fine Coal Driers**

Heyl & Patterson
INC.

55 FORT PITT BLVD. • PITTSBURGH 22, PA. • Phone COurt 1-0750

Since 1887 . . . Serving the Steel, Mining, Power and Transportation Industries.



Carpenter Stainless Tubing excells in quality and uniformity

Pictured above is a sectional view of a patented packless expansion joint for pipe lines, pressure vessels, and special requirements. Sizes from a few inches to several feet in diameter have been in service for 15 years at temperatures to 1800° F and pressures to 10,000 psi, and no functional failures have occurred, according to the manufacturer. Unique design and construction advantages, exclusive fabricating techniques, and highest quality materials account for this long record of failure-free service.

All expansion elements (corrugations) in this type of joint are formed from Carpenter Stainless Tubing by five punishing operations. "*There isn't a truer test of tubing quality,*" says the manufacturer. "*It must be perfect in all respects—uniform grain structure, wall thickness, size, soundness, and blemish-free surface. Inferior quality in any one factor will cause failures in fabrication as well as in use . . . Carpenter tubing is the only kind that has rendered consistently failure-free service.*"

Perhaps you can profit from this manufacturer's experience.

Many others, too, have found there is a time-saving, cost-cutting difference in stainless tubing quality and uniformity . . . and Carpenter makes it. So why not apply the advantages of this provable difference to products you design or fabricate? Start by contacting your nearest Carpenter Distributor or Representative for prompt information on your needs.

MEMBER

The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

Stainless Tubing & Pipe

The pioneer builder of machine-ground b/b screws announces a revolutionary new line of...

STANDARD-SIZED ROLLED-THREAD SAGINAW Ball/Bearing SCREWS PRICED AS LOW AS, OR LOWER THAN, ORDINARY ACME SCREWS!

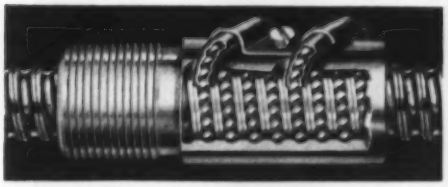
Get up to 6 times more efficiency... save at least 2/3 on power requirements or manual effort!

Here's great news for every manufacturer who uses Acme screws or hydraulic actuators in his product! Saginaw now offers Rolled-Thread *Safety b/b Screws* in standard sizes at amazingly low mass-production cost.

In many applications this new rolled-thread type will provide completely adequate performance at a fraction of the cost of machined-thread units.

GIVE YOUR PRODUCTS THESE PERFORMANCE ADVANTAGES AT NO INCREASE IN COST—

- **At least 90% efficiency guaranteed**—compared with 15% to 20% efficiency of Acme screws.
- **Requires less than 1/3 as much torque** as Acme screws for same amount of lineal output.
- **Saves substantially on cost, size and weight** of motors, gear boxes and auxiliary equipment.
- **Far less wear—less maintenance—longer life.**
- **Precision positioning**—free play can be virtually eliminated where necessary.
- **Operates dependably with or without lubrication** at temperatures from −75° F. to +175° F.



New standard Saginaw ball-nut can be furnished threaded or with flange or trunnion-type adaptors for easy application to almost any unit.

ROLLED-THREAD *SAFETY* b/b *SCREWS* CAN BE MANUFACTURED IN THESE STD. SIZES AND ANY SCREW LENGTH:

Ball Circle Diameter	Ball Size	Lead
.375	.0625	.125
.631	.125	.200
1.000	.15625	.250
1.171	.28125	.41304
1.500	.34375	.47368
2.250	.375	.500
3.000	.500	.660

ROLLED-THREAD *SAFETY* b/b *SCREWS* ARE ALREADY BEING SUCCESSFULLY USED IN THESE TYPICAL APPLICATIONS:

- Automatic Garage Doors
- Automobile Seat Adjusters and Window Lifts
- Barber Chairs
- Bumper Jacks
- Circuit Breakers
- Convertible Top Lifts
- Die Table Positioners
- Drill Presses
- Marine Steering Gears
- Welding Machines

Saginaw Steering Gear Division
General Motors Corporation
Dept. 9N, Saginaw, Michigan

Please send detailed data on your new Rolled-Thread *Safety b/b Screws*. I am interested in their application to:

Name—Title_____

Firm_____

Address_____

City_____ Zone____ State_____

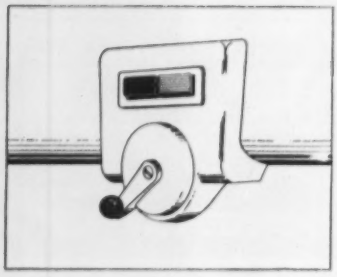
Mail coupon today for full details and engineering recommendations for your needs.

Safety ball bearing Screw by Saginaw

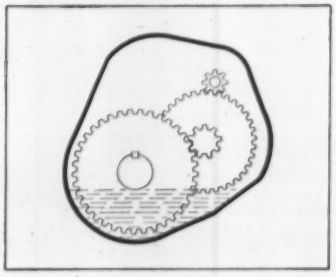
2 New CINCINNATI PRESS BRAKES

THIRTY TON - - - - 2-30 SERIES
FIFTY TON - - - - 3-50 SERIES

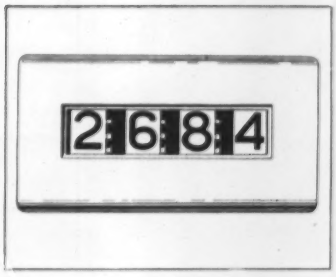
COMPETITIVELY PRICED



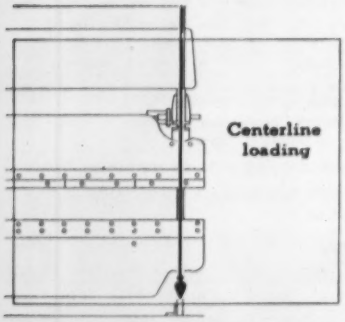
Front controlled, variable speed drive, 20 to 50 strokes per minute.



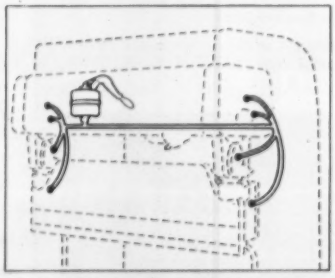
Completely enclosed transmission, running in oil.



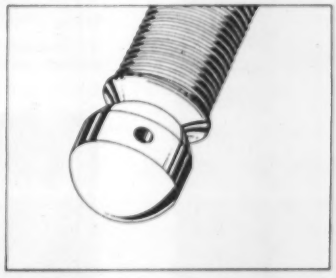
Two micrometer indicators, one at each end of the ram—easy to read and accurately record the amount of adjustment and tilt.



Centerline loading prevents weaving of the housings and insures accurate bends.



Centralized pressure lubrication system.



Ball end on the ram adjusting screws permits tapering of the ram for fade-out work.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

2-30 SERIES

This new 2-30 Series Cincinnati All Steel Press Brake has a capacity of 14 gauge x 6′ mild steel.

Look at these unusual standard features:

2½″ stroke—12″ shut height—9″ throat.

Distance between housings 5′-2″—overall die surface, 6′-0″.

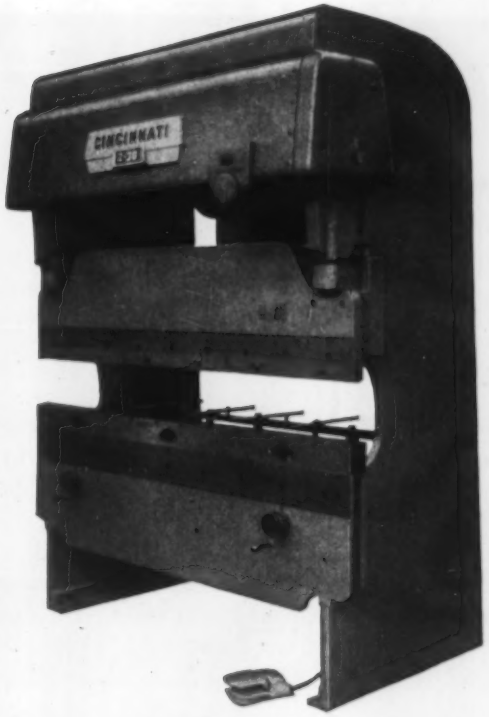
Front controlled, variable speed drive, 20 to 50 SPM. 4″ manual ram adjustment including ram tapering adjustment for fade-out work (power adjustment available as extra feature).

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾″ angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



3-50 SERIES

These new 3-50 Series Cincinnati All Steel Press Brakes are built in two lengths and have a capacity of 10 gauge x 6′ mild steel. Investigate these unusual standard features: 3″ stroke—12″ shut height—12″ throat—distance between housings 6′-6″ or 10′-6″—overall die surface 8′-0″ or 12′-0″—front controlled, variable speed drive, 20 to 50 SPM.

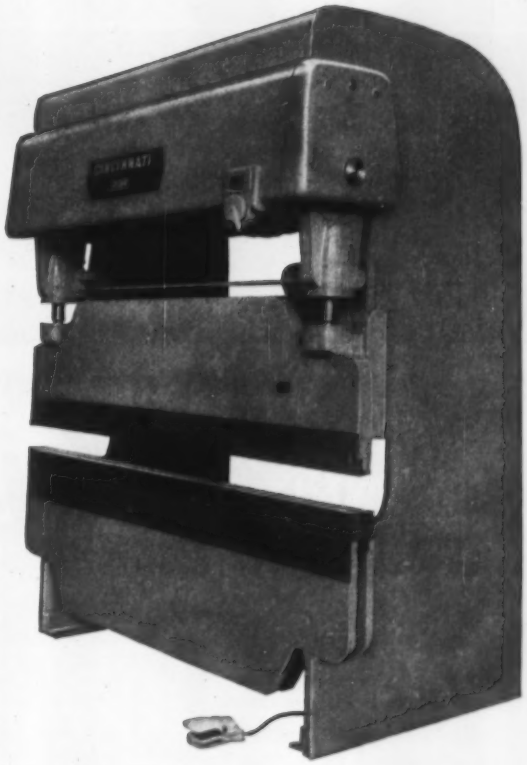
5″ motorized ram adjustment, including ram motor and control, complete with ram tapering adjustment for fade-out work.

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾″ angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



RAMMING MIX BOOKLET

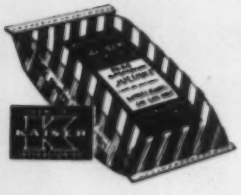
...that every steel man should have!

THIS new free booklet is the most valuable handbook on steel furnace bottom ramming procedures ever offered.

It will be mailed to you when you send the coupon below.

Many of the suggestions and recommendations contained in this 36-page booklet have come from our customers, who cooperated in joint studies in their open hearths and electric steel furnaces.

All of the recommendations are designed to help you obtain substantial savings and establish new performance records through the proper use of Permanente #165 Ramming Material and Permanente #84 Ramming and Patching Material.



Kaiser Chemicals

Pioneers in Modern Basic Refractories

ATTACH THIS COUPON TO YOUR LETTER NOW FOR YOUR FREE COPIES:

We suggest that you order enough copies of this convenient booklet for every member of your organization concerned with the improved operation of your open hearths or electric steel furnaces.

Please send _____ copies of your free booklet entitled, "Suggested Methods for Installing Permanente # 165 and 84 Ramming Materials."

Kaiser Chemicals Division,
Kaiser Aluminum & Chemical Sales, Inc.
1924 Broadway, Oakland 12, California.

NAME _____

ADDRESS _____

POSITION _____

CITY _____ STATE _____

CALENDAR
OF MEETINGS

Sept. 26-27, Radio-Electronics-Television Manufacturers Association: Symposium on automation. Irvine Auditorium, University of Pennsylvania, Philadelphia. Association's address: 777 14th St. N.W., Washington 5, D. C. Secretary: James D. Secrest.

Sept. 26-28, American Management Association: Personnel conference. Hotel Statler, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice President: James O. Rice.

Sept. 26-29, Association of Iron & Steel Engineers: Annual convention. Sherman hotel, Chicago. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

Sept. 26-30, Atomic Industrial Forum Inc.: Trade fair of the atomic industry. Sheraton-Park hotel, Washington. Forum's address: 260 Madison Ave., New York 16, N. Y. Executive manager: Charles Robbins.

Sept. 28-30, National Association of Foremen: Annual meeting. Texas hotel, Ft. Worth, Tex. Association's address: 321 W. First St., Dayton 2, O. Secretary: Jean B. Adams.

Sept. 29-30, American Hot Dip Galvanizers Association: Semiannual meeting. Sheraton-Belevedere hotel, Baltimore. Association's address: 1806 First National Bank Bldg., Pittsburgh 22, Pa. Secretary: Stuart J. Swensson.

Sept. 29-30, Refractories Institute: Fall meeting. Broadmoor hotel, Colorado Springs, Colo. Institute's address: First National Bank Bldg., Pittsburgh 22, Pa. Executive secretary: A. C. Newton.

Sept. 29-Oct. 1, American Ceramic Society Inc.: Materials and equipment—white wares divisions joint meeting. Bedford Springs hotel, Bedford, Pa. Society's address: 4055 N. High St., Columbus 2, O. General secretary: Charles S. Pearce.

Oct. 3-5, National Electronics Conference Inc.: Annual meeting and exhibit. Sherman hotel, Chicago. Conference address: 84 E. Randolph St., Chicago 1, Ill. Executive secretary: John S. Powers.

Oct. 3-7, American Institute of Electrical Engineers: Fall general meeting. Hotel Morrison, Chicago. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Oct. 6-7, National Foundry Association: Annual meeting. Edgewater Beach hotel, Chicago. Association's address: 53 W. Jackson Blvd., Chicago, Ill. Secretary: Charles T. Sheehan.

Oct. 6-8, Society of Industrial Designers: Annual meeting. Woodner hotel, Washington. Society's address: 48 E. 49th St., New York 17, N. Y. Secretary: Sally G. Swing.

Oct. 7-8, American Ceramic Society Inc.: Refractories division meeting. Bedford Springs hotel, Bedford, Pa. Society's address: 4055 N. High St., Columbus 2, O. General secretary: Charles S. Pearce.

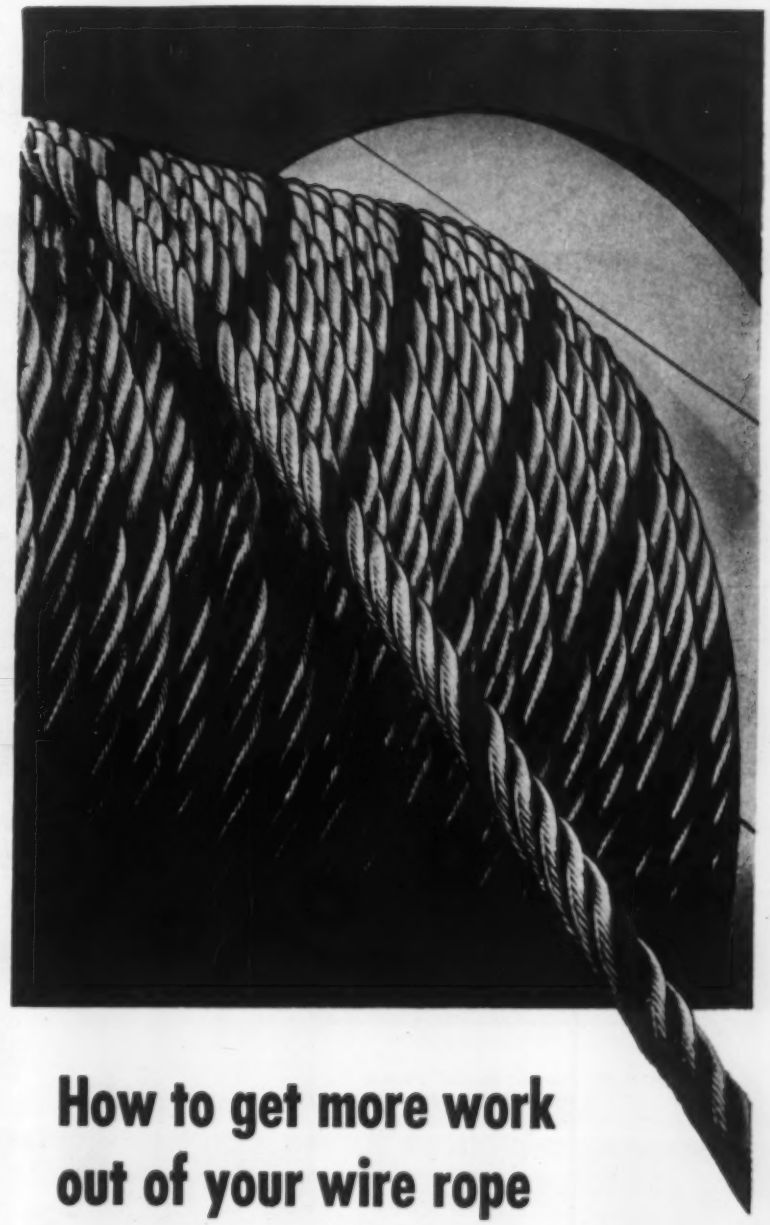
Oct. 9-13, Electrochemical Society Inc.: Fall meeting. Statler hotel, Pittsburgh. Society's address: 216 W. 102nd St., New York 25, N. Y. Secretary: Dr. Henry B. Linford.

Oct. 9-13, Pressed Metal Institute: Fall meeting. Grove Park Inn, Asheville, N. C. Institute's address: 2860 E. 130th St., Cleveland, O. Managing director: Harold A. Daschner.

Oct. 10-12, American Mining Congress: 1955 metal and nonmetallic mining convention. Las Vegas, Nev. Congress' address: 1102 Ring Bldg., Washington, D. C. Executive vice president: Julian D. Conover.

Oct. 10-12, American Society of Lubrication Engineers and American Society of Mechanical Engineers: Joint lubrication conference. Antlers hotel, Indianapolis. Information: American Society of Lubrication Engineers, 84 E. Randolph St., Chicago 1, Ill. Secretary: William P. Youngclaus Jr.

Oct. 10-12, Truck Body & Equipment Association Inc.: Annual convention and exhibit. Morrison hotel, Chicago. Association's address: 1616 K St. N.W., Washington 6, D. C. Executive manager: Arthur H. Nuesse.



How to get more work out of your wire rope

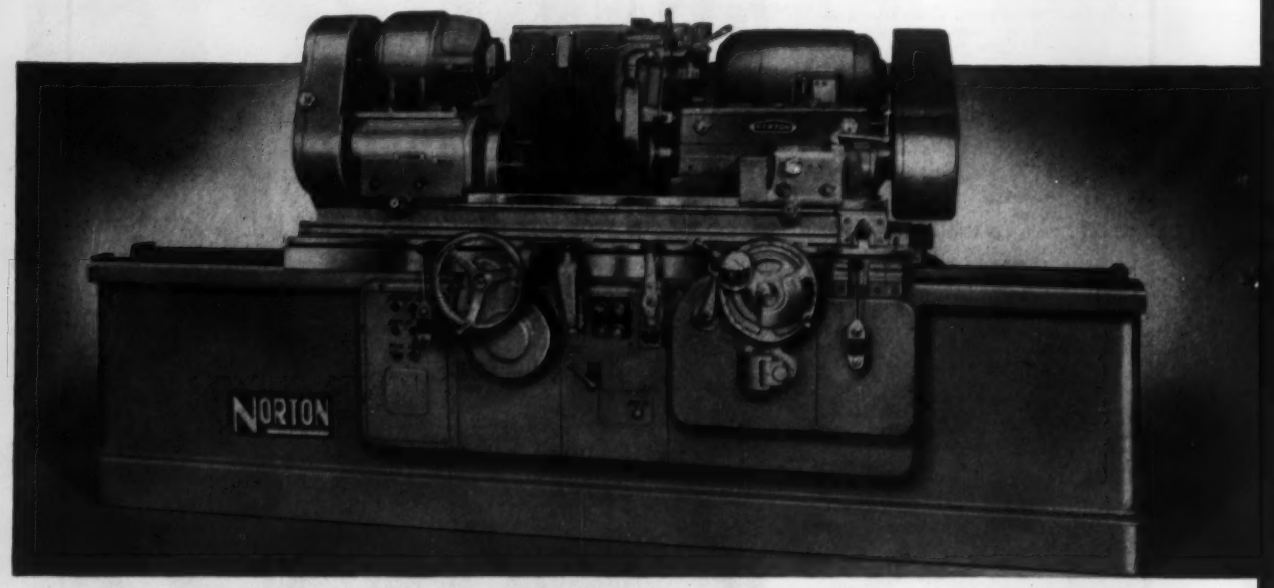
Get *higher-than-rated quality.*
Get *longer-than-expected service.*
Use Hercules Red-Strand.
It costs no more.

LESCHEN
HERCULES *Red-Strand*™
WIRE ROPE

from leading distributors

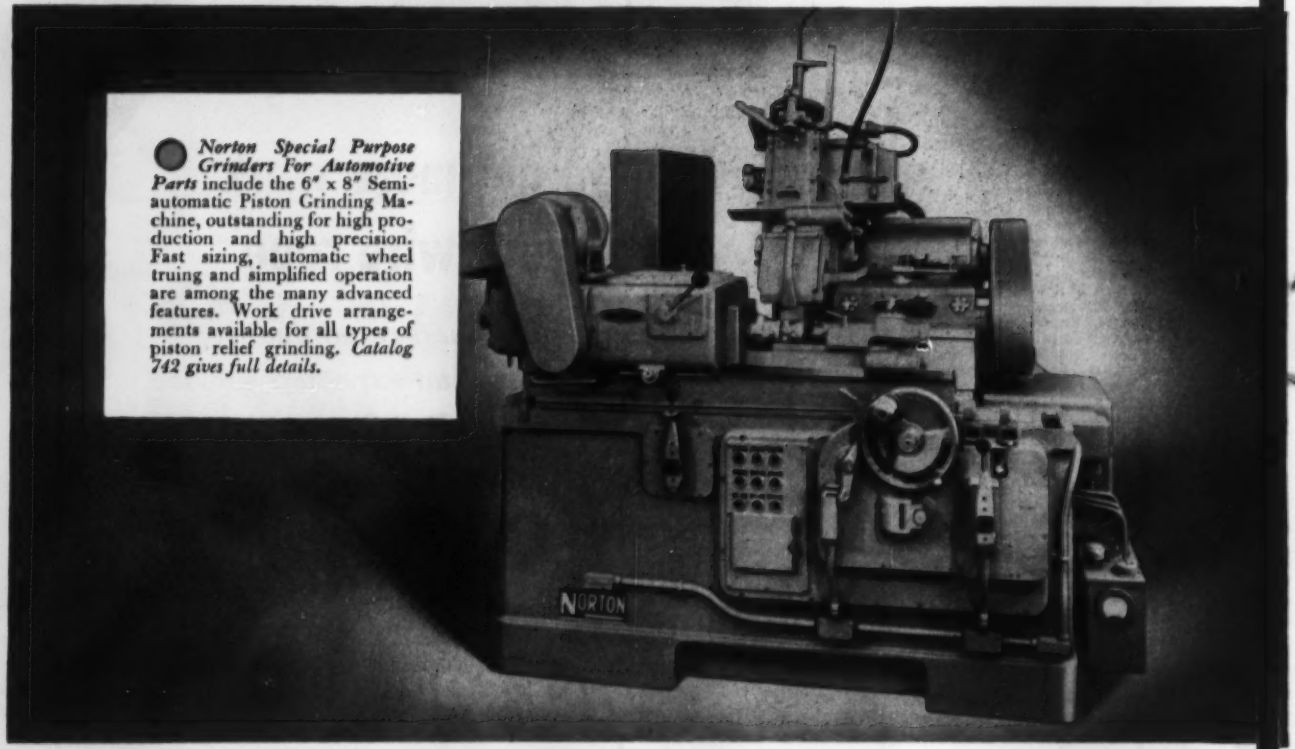
LESCHEN
WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri

6 from the world's most



● *Norton General Purpose Production Type Cylindrical Grinders.* The 10″ x 36″ Type CTU Semi-automatic, a top performer among grinding machines of this type, offers a unique combination of speed, accuracy, flexibility and sturdiness. One-lever control of the automatic grinding cycle reduces operator's duties to loading and unloading. Production line and job shop users report Norton 10″ CTU's have doubled production, replaced several machines, eliminated extra operations. *Write for Catalog 1787.*

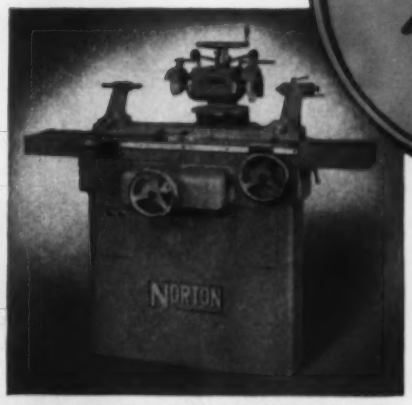
● *Norton Special Purpose Grinders For Automotive Parts* include the 6″ x 8″ Semi-automatic Piston Grinding Machine, outstanding for high production and high precision. Fast sizing, automatic wheel truing and simplified operation are among the many advanced features. Work drive arrangements available for all types of piston relief grinding. *Catalog 742 gives full details.*



complete line of

money-saving grinders and lappers

Norton Surface Grinders are well represented by this 8″ x 24″ Hydraulic Grinder. Designed with both hand and power table traverse and cross feed, it produces plane surfaces smoothly and speedily. Convenient controls and easy accessibility keep operating and maintenance times low. Extra equipment, such as magnetic chucks, wet grinding attachment and individual dust exhaust system meet all operating conditions. *Write for Catalog 190.*



Norton Tool Room Cutter Grinders. The No. 20 Cutter and Tool Grinder is the most versatile machine in its class. The wheel head tilts up to 15° above or below horizontal, and may be swivelled through 360° — simplifying such jobs as grinding taper reamers, step counterbores, form tools and milling cutters. Other pace-setting advantages include long table traverse and wheel slide travel . . . integral motor spindle . . . wheel slide graduated dials readable from any angle. No other cutter and tool grinder does so many jobs so fast, so easily. *Catalog 189 tells you why.*

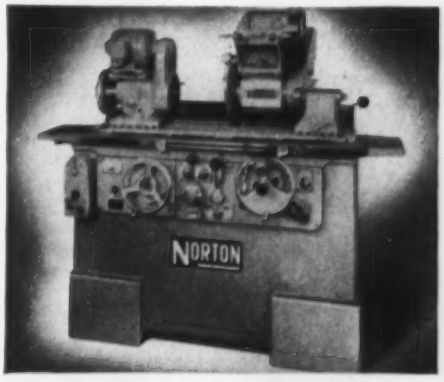
Norton Lapping Machines. The Type 16FC Vertical Lapper brings you outstanding production capacity for such work as diesel injector parts, plug gages, size blocks, sides of small bearing races, pump gears and plates and many other parts. Laps flat work up to 3″ x 5″, and cylindrical work up to 3″ diameter, producing a high degree of accuracy and finish. *Catalog 212 gives you details.*

Only Norton offers you such long experience in both grinding machines and wheels to help you produce more at lower cost.

The six machines shown here are typical products of that experience — bringing you ahead-of-the-parade design that speeds production and adds maximum product-value on every job they do for you.

But remember — these six advanced machines represent only a small fraction of the world's broadest line. Besides many models of cylindrical, surface, crankshaft and camshaft grinding machines, Norton produces a wide range of lapping machines, tool room grinders and special types for grinding pistons, valves, jet parts, etc.

A new illustrated folder #1843 lists the entire Norton line of grinding and lapping machines and tells you how to get all the facts on each unit. For your copy, write to NORTON COMPANY, Machine Division, Worcester 6, Mass. *In Canada:* J. H. Ryder Machinery Co., Ltd., Toronto 5.



Norton 10″ Universal Grinders. The 10″ x 20″ Universal Grinder has the flexibility to handle an almost endless variety of jobs. Compound swivel arrangement of wheel head enables you to make separate angular settings of wheel and feed. External, internal, face or angular wheel slide operations are easy. Chuck may be mounted on one end of work head spindle, ready for use by turning head 180°. *Write for Catalog 170.*

To Economize, Modernize With NEW

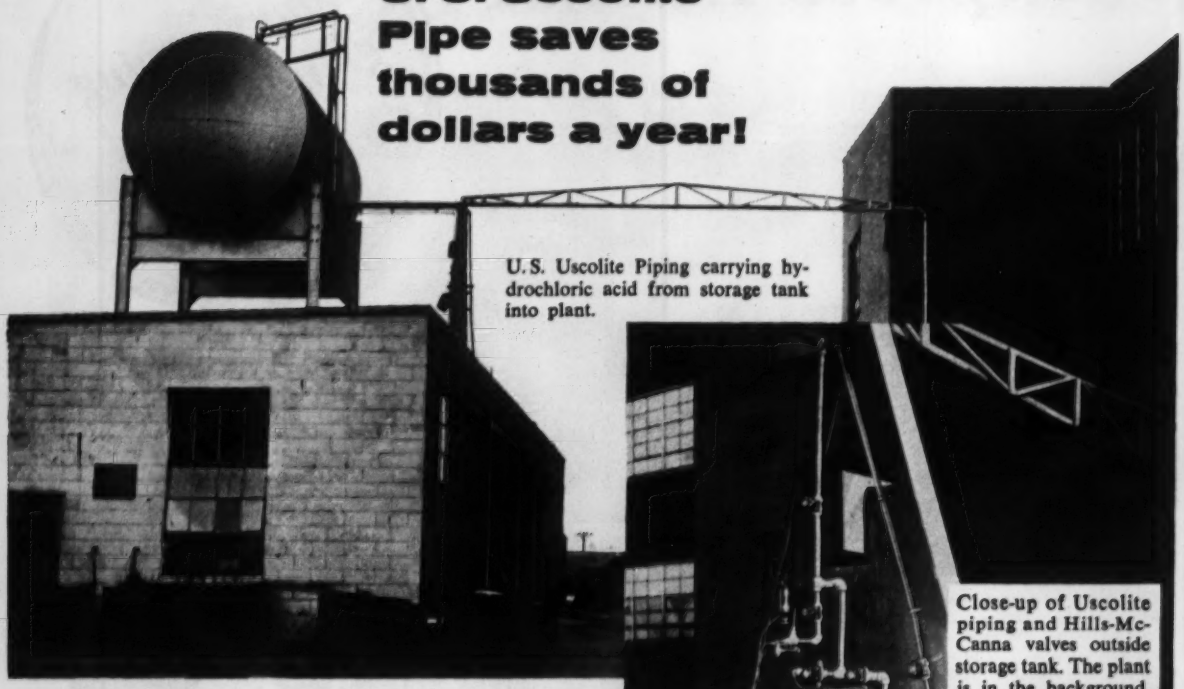
NORTON

GRINDERS and LAPPERS

Making better products . . . to make other products better

District Sales Offices: Worcester • Hartford • New York
Cleveland • Chicago • Detroit

New acid-handling system incorporating U. S. Uscolite Pipe saves thousands of dollars a year!



U.S. Uscolite Piping carrying hydrochloric acid from storage tank into plant.

Close-up of Uscolite piping and Hills-McCanna valves outside storage tank. The plant is in the background.

A large Eastern manufacturer of lighting and signaling systems uses 300 feet of Uscolite® plastic pipe to carry hydrochloric acid from storage tanks outside the plant across an areaway, and then through various production departments to final use in the plating room. Previously, carboys of acid had been used, because the plant had no facilities to store acid in bulk. But by installing a new acid-handling system, using U. S. Uscolite piping and fittings, the plant saves thousands of dollars a year—they now *buy and store in bulk*. Additional thousands are saved by reduced handling costs.

The plant also fabricated its own fume hoods from Uscolite sheet stock, for use in the plating operation. The plant engineer is pleased because Uscolite's unusual mechanical strength enables it to be left exposed in any weather, and to be run overhead through various parts of the plant without fear of damage to men or machines. Hills-McCanna Uscolite valves are used in the piping assembly.

Uscolite pipe and fittings are made in the broadest and largest line of stock sizes on the market.

Made by United States Rubber Company, Uscolite is light in weight with high impact strength. It is solving acid and corrosion problems in every industry. The piping can be easily threaded and installed with conventional tools. For replacements or a completely new piping system, get in touch with any of our 27 District Sales Offices, or write to address below.

"U.S." Research perfects it..."U.S." Production builds it...U.S. Industry depends on it.

UNITED STATES RUBBER COMPANY

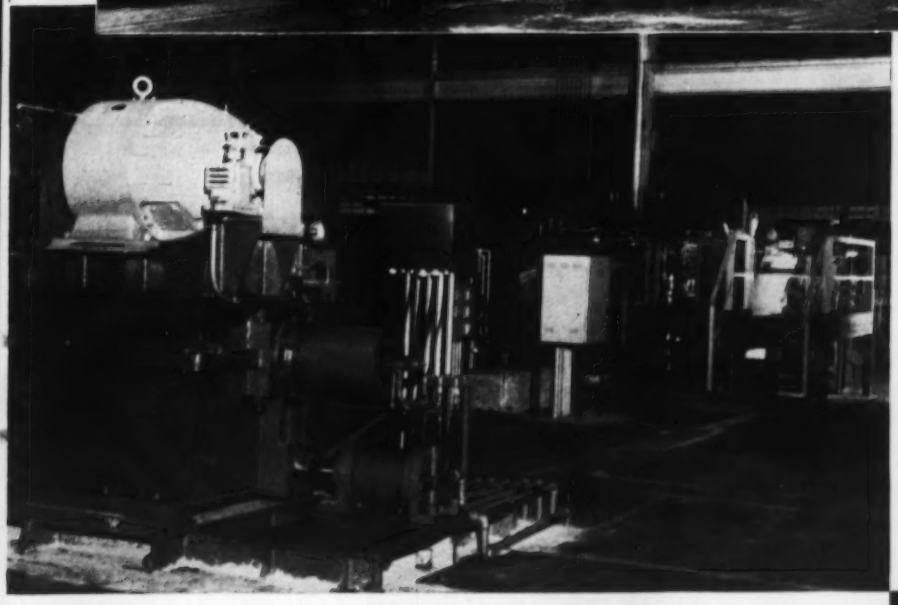
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

WEAN

SHEET, STRIP AND TIN MILL EQUIPMENT IS SPECIFICALLY DESIGNED FOR

INCREASED PRODUCTIVITY



The best advertisement for any product is the testimony of a satisfied customer. When it comes to fully integrated pickling lines, Wean can point to many highly successful installations.

For example, the line in operation at the Indiana Harbor Works of the Youngstown Sheet and Tube Company (shown here) — where high grade pickling is essential—has been delivering a product of the highest quality, consistently, since installation.

When next you're considering pickling equipment why not talk it over with Wean engineers and get the one line that is designed for increased productivity, economy and ease of maintenance.

The WEAN **ENGINEERING CO., INC.**

WARREN, OHIO

SPECIALISTS IN SHEET, TIN AND STRIP MILL EQUIPMENT

Check these Advantages

COMBINATION ALLOY

In making steel, silicon and manganese are much more effective in combination than when used separately. ELECTROMET silicomanganese is designed for the simultaneous addition of silicon and manganese in the correct proportion.

FAST SOLUBILITY

Because of the concentration of active elements in ELECTROMET silicomanganese, less time is required for solution in molten steel than when equivalent amounts of silicon and manganese are used separately in the form of ferrosilicon and ferromanganese.

LESS CHILL

The weight of silicomanganese is less than the weight of equivalent amounts of ferrosilicon and ferromanganese. The chilling effect is less with the lower weight of the silicomanganese addition.

LOW CARBON CONTENT

When ELECTROMET silicomanganese is added in the ladle, the low carbon content of the alloy allows the melt to be tapped at a higher carbon level with a saving in furnace time.

DEOXIDIZER FOR SEMI-KILLED STEELS

ELECTROMET silicomanganese is particularly effective as a ladle addition for the deoxidation of semi-killed steels.

METALLURGICAL SERVICE AVAILABLE

Our metallurgists will be glad to assist you in the application of ELECTROMET silicomanganese to your specific requirements. For further information, please get in touch with the nearest ELECTROMET office.

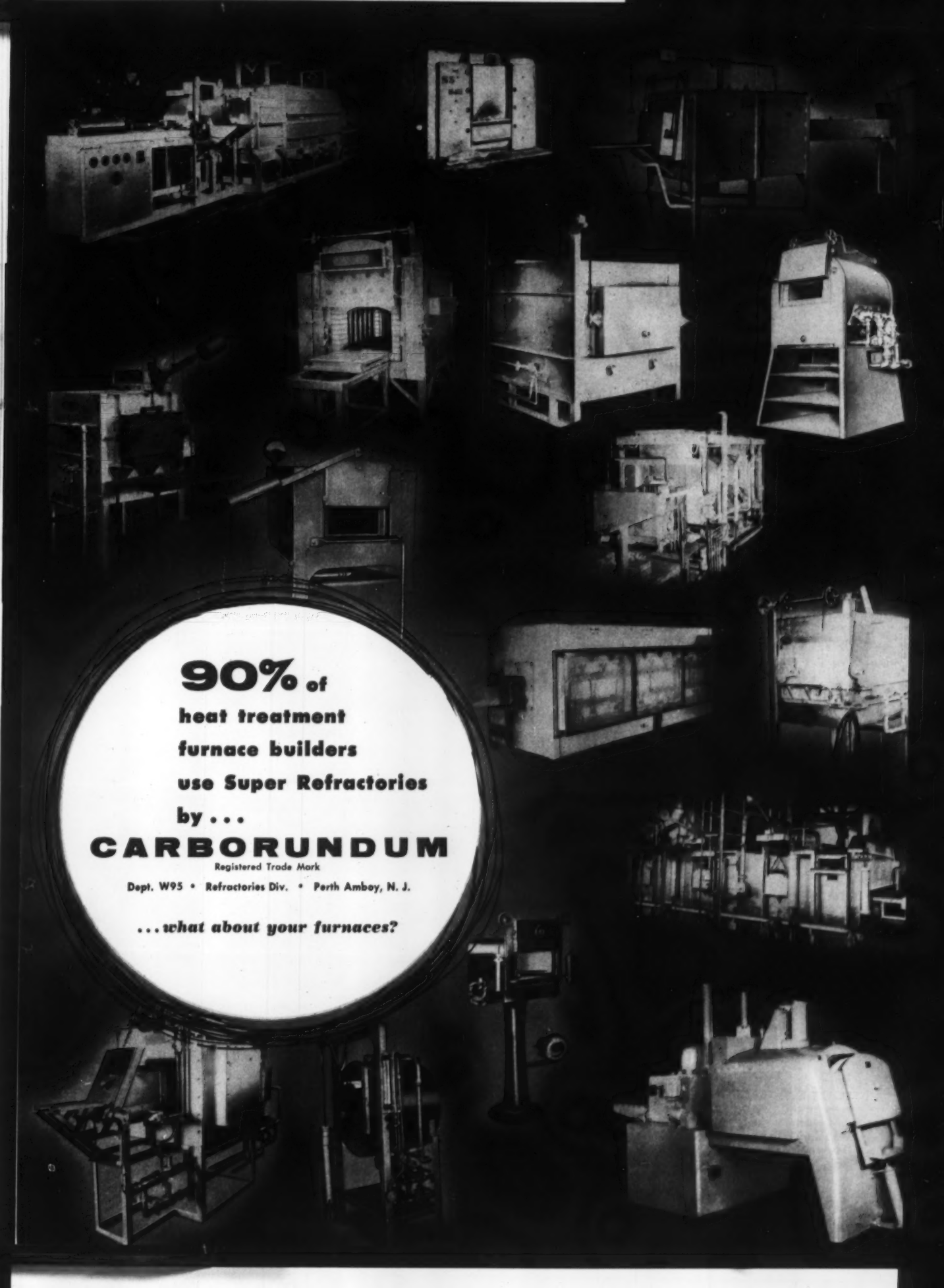
ELECTRO METALLURGICAL COMPANY

A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

OFFICES: Birmingham • Chicago • Cleveland • Detroit
Houston • Los Angeles • New York • Pittsburgh • San Francisco

In Canada: Electro Metallurgical Company, Division of Union Carbide Canada Limited, Welland, Ontario

The term "Electromet" is a registered trade-mark of Union Carbide and Carbon Corporation.


90% of
heat treatment
furnace builders
use Super Refractories
by . . .
CARBORUNDUM
Registered Trade Mark
Dept. W95 • Refractories Div. • Perth Amboy, N. J.
. . . what about your furnaces?

CF&I-WICKWIRE MAKES WIRE

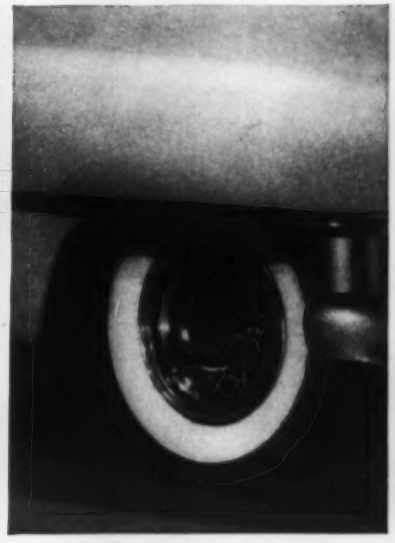
PLANE ANSWERS pilot's every direction—thanks to strong, flexible control cables made of CF&I-Wickwire Aircraft Cord Wire. This wire undergoes extremely rigid testing to meet highly exacting specifications.

FOR A CLEAN SWEEP. Power street-sweeping machines use bristles of tough CF&I-Wickwire Flat Tempered Brush Wire.

BEAUTY TIPS. Tons of wire are used by beauty shops in the form of bobby pins, hairpins and curlers. CF&I-Wickwire Hairpin Wire is used for these and many other mass-produced cosmetic items.

FOR THOUSANDS OF USES

"SPRING TIME" COMFORT. Coil bedsprings, mattress inner springs and mattress edge reinforcing are all made of CF&I-Wickwire Spring Wire in several tempers and hardnesses.



ROLLING ON WIRE. Strong, rigid spokes for automobile wheels are made of CF&I-Wickwire Spoke Wire.

MAKING BOOK. This eager young student's notebooks and textbooks are bound with CF&I-Wickwire Bookbinder Wire and Spiral Binding Wire.

from holding a plane on its course,
to keeping a curl in place...
wire is the practical answer!

Wire can answer an almost incredible variety of needs because it can be varied to provide thousands of different combinations of mechanical and physical properties. From wire that can be easily twisted by hand to a rigid, self-supporting wire, it can be "tailor-made" to meet almost any set of requirements. Whatever you assemble, manufacture, or process, look into the many advantages of using CF&I-Wickwire Wire. You'll like doing business with CF&I-WICKWIRE and the careful attention given your own particular requirements.

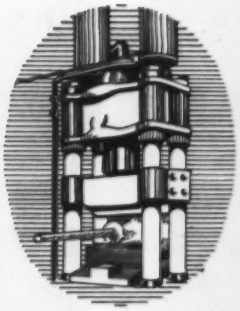
CF&I-Wickwire Wire is made in plants conveniently located from coast to coast. For detailed information, write our nearest district sales office.

3145

CF&I—WICKWIRE WIRE

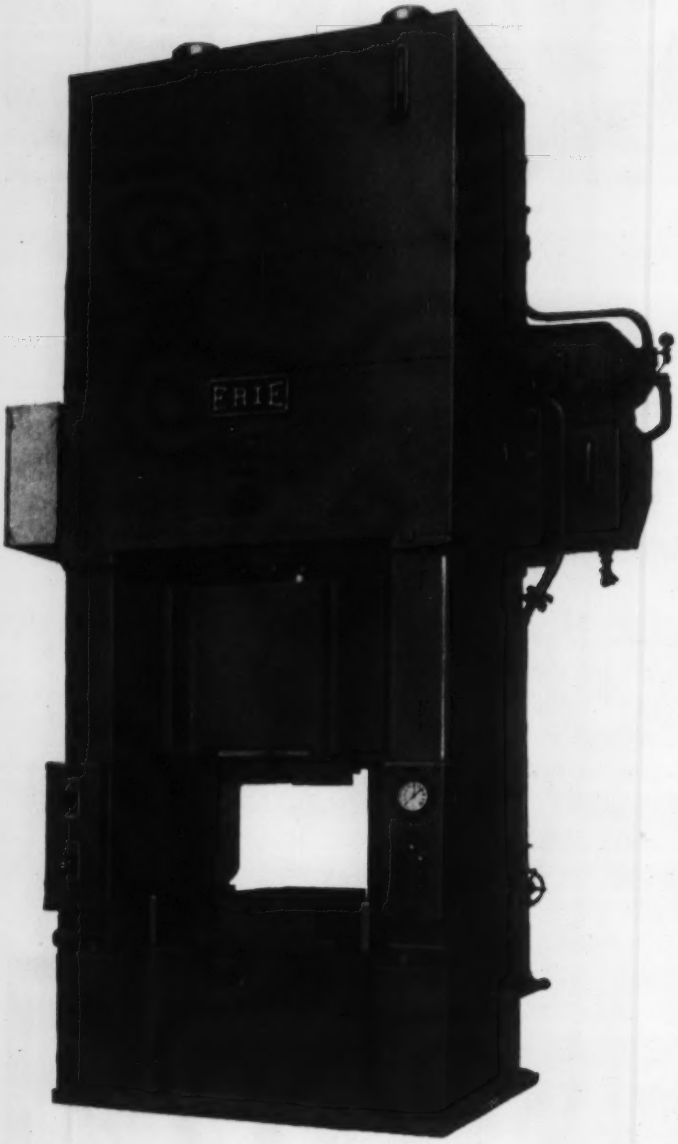
THE COLORADO FUEL AND IRON CORPORATION—Albuquerque · Amarillo · Billings · Boise · Butte · Denver
El Paso · Ft. Worth · Houston · Lincoln (Neb.) · Oklahoma City · Phoenix · Pueblo · Salt Lake City · Wichita
PACIFIC COAST DIVISION—Los Angeles · Oakland · Portland · San Francisco · Seattle · Spokane
WICKWIRE SPENCER STEEL DIVISION—Atlanta · Boston · Buffalo · Chicago · Detroit · New Orleans · New York · Philadelphia

in the good old days



When press forging was done on steam hydraulic presses, water intensified . . . power strokes were short and slow.

Even then ERIE was the greatest name in forging machinery in both presses and hammers . . .



today

Erie Foundry has just built this extremely fast hydraulic forging press. This 1000-ton semi-automatic machine, used to forge jet engine turbine blades by a special process, completes a *6" stroke cycle in just 4 seconds.*

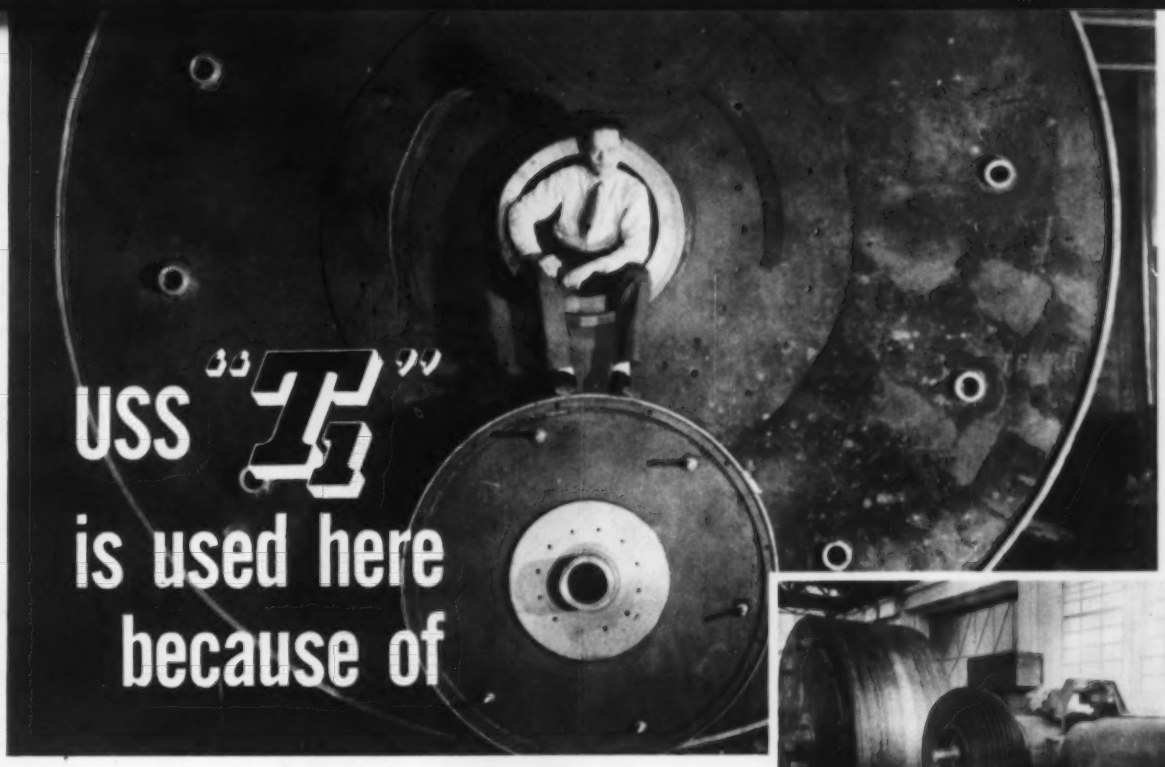
Its high speed is achieved by using two self-contained pumps. This forging press incorporates speed control with automatic pressure and precision reversal by means of a special compression and decompression feature, designed by Erie hydraulic engineers. Maximum stroke is 28". A long (1 to 1) guide ratio insures accuracy. By combining side housing and strain rod construction, the machine is made rigid and produces perfect forgings.

Just one more indication of why Erie Foundry is today the greatest name in forging machinery.

in our 60th year

ERIE

ERIE FOUNDRY CO. ERIE, PA.



USS "T-1" is used here because of

'ROUND AND 'ROUND the flywheel goes, at a speed of 300 mph. Suddenly, an aircraft wheel assembly rams against it, with the impact of a loaded airplane. The tire squeals, the brake is applied, and in just 20 seconds the wheel stops. A real rugged test—both for the wheel assembly and for the steel in the flywheel. USS "T-1" Steel passed the test. In fact it is the best steel that could be used for this high speed application.

...its great strength

...its ease of fabrication

High speed tire, brake, and wheel testing machines like the one shown here, manufactured by Adamson United Company, Akron, Ohio, a subsidiary of United Engineering and Foundry Co., are used to prove out aircraft landing gear. The gigantic flywheels on these machines simulate the speed and inertia of an actual airplane during landing and take-off.

Until a short time ago, testing machines were built to rotate at peripheral speeds up to 250 mph. But when the aircraft industry spread its wings, faster testing machines were needed. The new machines had to rotate at speeds as high as 300 mph—and stay in one piece. They had to be extremely strong . . . lightweight . . . and easy to fabricate.

That's when USS "T-1" Steel entered the picture.

For flywheels rotating 300 mph, a steel of extremely high tensile strength was needed to withstand the tremendous stresses generated. A steel permitting the greatest strength for the thinnest section was needed. And, above all, the steel had to be capable of developing full 100% weld strength.

USS "T-1" Steel more than met all Adamson United's requirements.

Other steels could have provided the strength and met the weight requirements. None but "T-1" provided these and good weldability too.

UNIQUE PROPERTIES—"T-1" Steel's unique combination of physical properties has solved many similar problems. "T-1" can be welded satisfactorily *without* pre- or post-heating—it can be welded either in the shop or field. Always, it provides great tensile strength (105,000 psi minimum with yield strength of 90,000 psi minimum), phenomenal toughness and excellent abrasion resistance. Write for full particulars. United States Steel, Room 4903, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL CORPORATION, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS "T" CONSTRUCTIONAL ALLOY STEEL

USS

UNITED STATES STEEL

"It's the biggest alloy forging

says
Edward Schuerman,
U. S. Steel Hooker Leader

THAT PIECE OF STEEL held by the crane weighs 280,000 pounds. It is 30 inches thick, over 11 feet wide, and 22 feet long. An identical piece lies on the floor. Both will be parts for an extremely large press.

If you are a steel man, you may not be especially impressed by these figures, until you realize that the forgings are made from heat treated alloy steel . . . and the steel for each piece was poured as one heat from a single furnace.

Just *handling* forgings like these is a tough job, a job that falls into the lap of men like Edward Schuerman, Hooker Leader, a U.S. Steel employee for 29 years. He has to choose the correct hook or sling assembly, spot the crane, and supervise the lift. One mistake could delay a shipment by months, but Ed has never dropped a forging in his life.

This is the kind of man who works on every USS Quality Forging. You can put your faith in these men, in the steel that comes from our furnaces, and in the modern equipment that means prompt delivery and highest possible quality.

Write for our free 32-page booklet that describes USS Quality Forgings. Address inquiries or booklet requests to United States Steel, Room 4903, 525 William Penn Place, Pittsburgh 30, Pa.

SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL

USS

Quality FORGINGS

- heavy machinery parts—carbon, alloy, stainless
- forged steel rolls and back-up roll sleeves
- electrical and water wheel shafts
- hammer bases and columns

The complete pick-up tank is supplied with sample compartment, pump and hose. Stainless Steel is used for both interior and exterior surfaces. Stainless & Steel Products Company, St. Paul, Minn., is the manufacturer.

This tank truck had to be made from Stainless Steel

Tank shells are rolled on a 10′ roll. Notice adhesive cloth tape used to protect inside surface of tank until job is complete.

The dairy and dairy equipment industries have been awfully busy these past few years, working out ways to reduce costs and maintain the flavor and quality of milk.

One major step has been *bulk milk* pickup. Instead of storing his milk in cans, today's modern farmer uses a Stainless Steel storage tank. Then, every-other-day, the dairy sends a tank truck to pick up the milk. The tank on the truck has to be made from Stainless Steel, because no other metal has such a unique combination of strength, corrosion resistance and cleanability.

The manufacturer of this tank truck uses Types 302 and 304 Stainless Steel—14-gauge shells for tanks 2000 gallons and under, 12-gauge for tanks 2000 to 5000 gallons. Both gauges are sheared, rolled and punched on equipment with a nominal capacity of 3/8" carbon steel. Holes are cut with a carbon-arc torch, and all fittings are attached with electric arc welding.

If you have been wondering whether you can handle Stainless Steel successfully in your own shop with your present equipment, just remember that fabrication of Stainless Steel isn't difficult — it's just different.

UNITED STATES STEEL CORPORATION, PITTSBURGH
AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

USS

UNITED STATES STEEL

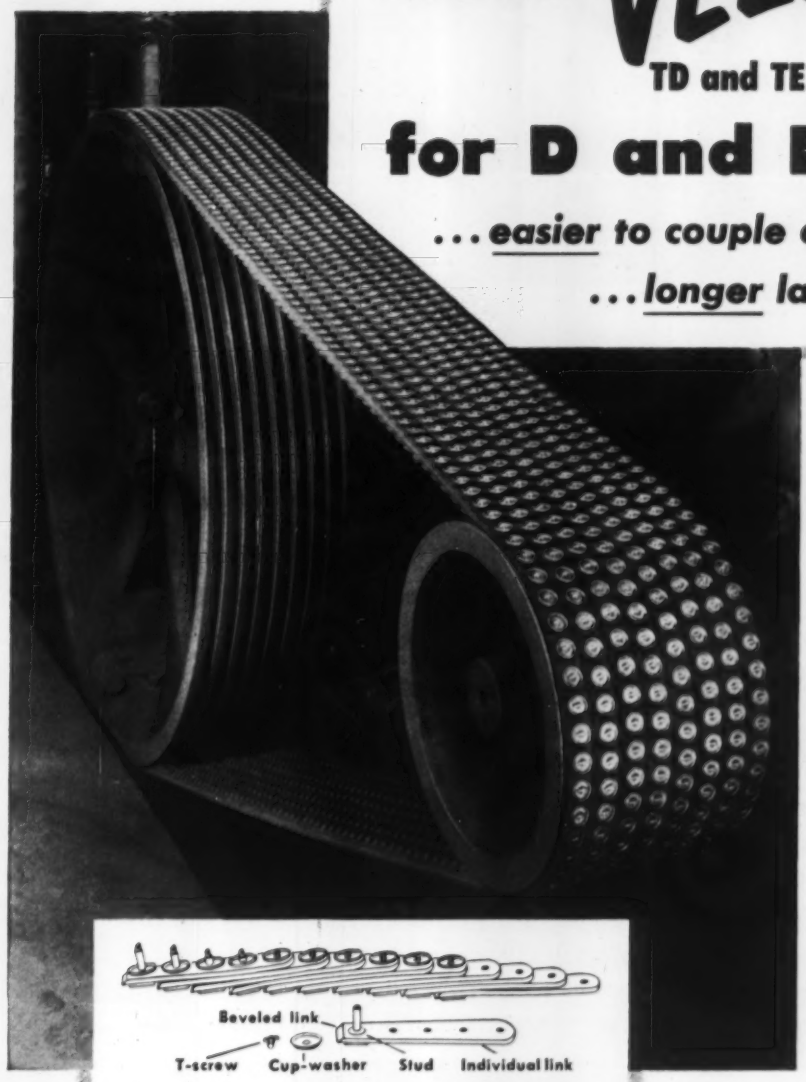
NEW VEELOS

TD and TE Adjustable V-belts

for D and E Drives

...easier to couple and uncouple

...longer lasting



This detailed line drawing of the new Veelos TD and TE v-belt makes it easy to see how this new v-belt is designed to do a better job... easier!

Now get the v-belt that's been especially developed for D and E drives—the new, patented Veelos TD and TE adjustable v-belt!

This new Veelos has advantages unmatched by any other v-belt. It is *installed quickly* without removing the outboard bearings found on most D and E drives. It is the easiest v-belt to couple and uncouple ever developed. Cup-washers and T-screws join links together to form individual belts of any length. Veelos TD and TE *lasts longer* because new high-tensile strength links plus the new stud, cup-washer and T-screw design give *added strength* —combines this added strength with *maximum flexibility* for cooler, smoother running.

Install this new Veelos TD and TE v-belt on your D and E drives. Prove to yourself why there's no v-belt that can match the performance, the efficiency and the economy of Veelos TD and TE.

Get the complete story of this great new v-belt for D and E drives. Send the coupon now for new 8-page illustrated catalog.

VEELOS
THE LINK
V-BELT

Veelos is known as Veelink outside the United States.

MANHEIM MANUFACTURING & BELTING CO.
613 Manbel St., Manheim, Pa.

Please send copy of your new Veelos TD and TE v-belt catalog.

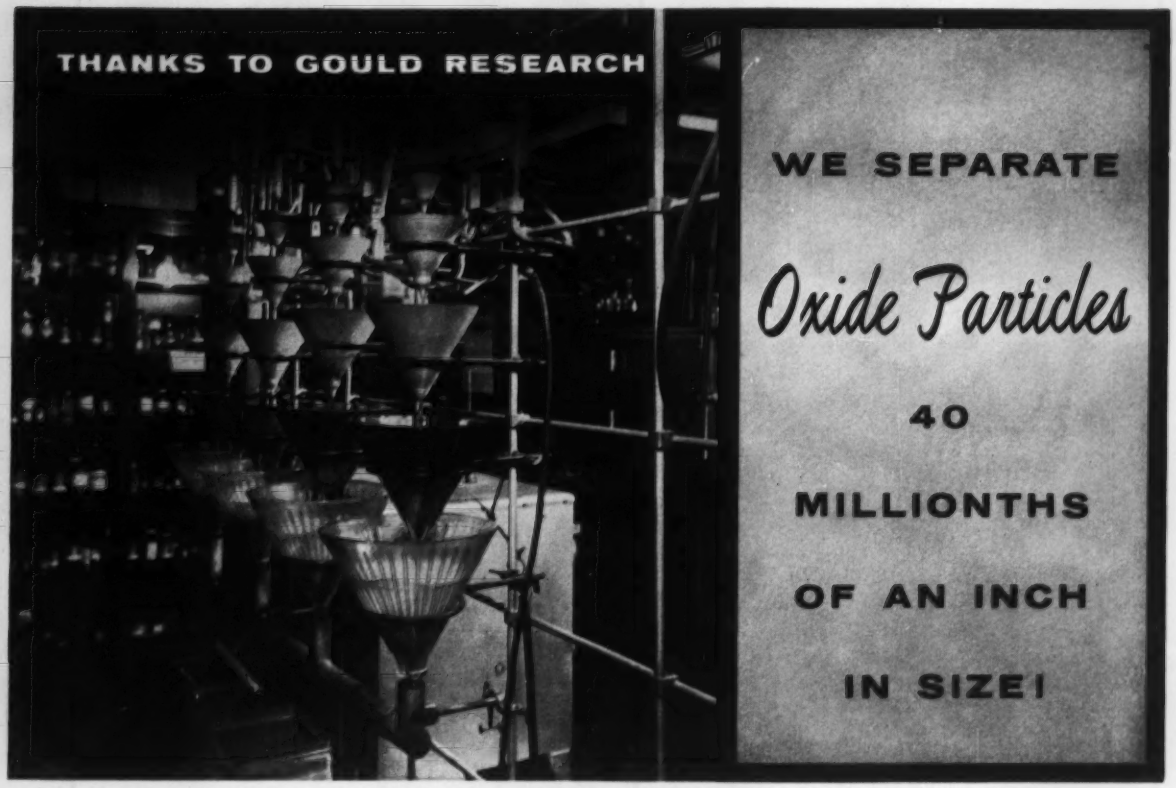
Name .....

Company .....

Address .....

.....

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

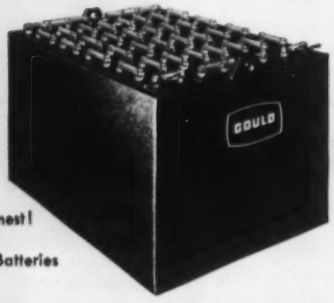


TO GIVE YOU GREATER BATTERY CAPACITY!

Illustrated above is a Thompson Classifier in the Gould Battery Research Laboratory at Depew, N. Y. It is used to separate, by flotation, particles of lead oxide so small that they'll pass through the finest sieve made.

Particle separation is important in achieving uniformity of oxide . . . and battery capacity and life are helped by having each type of oxide fall within a specific particle size range.

This method of particle separation quickly determines which oxides are best for various types of Gould Batteries. Another reason why you get better batteries from Gould through research.



America's Finest!
GOULD
Industrial Truck Batteries

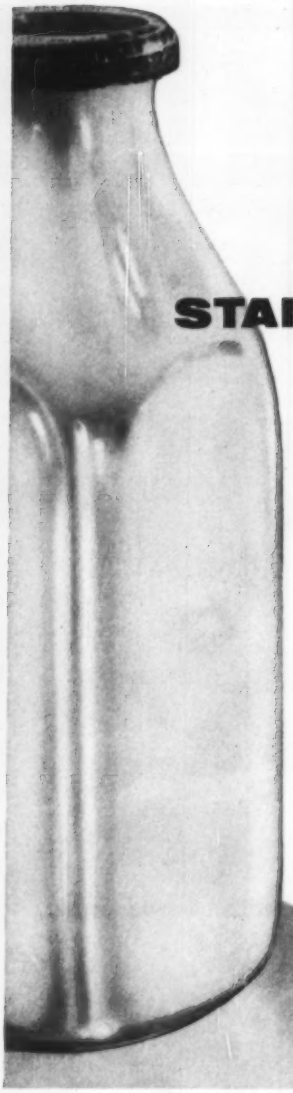
© 1955 Gould-National Batteries, Inc.

GOULD
Batteries

GOULD-NATIONAL BATTERIES, INC.
TRENTON 7, N. J.

"BETTER BATTERIES THROUGH RESEARCH"

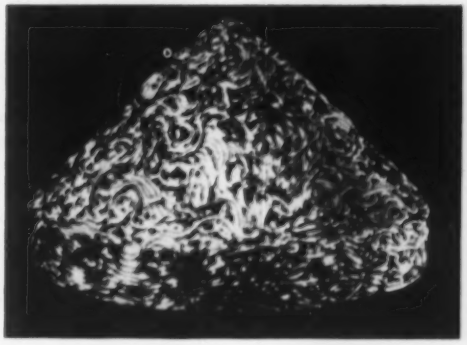
Always Use Gould-National Automobile and Truck Batteries



How this

STAINLESS STEEL WIRE CONE

makes the cream line vanish



● All of the cream that used to rise to the top of a bottle of milk is still there. But now you can't see it. Homogenizing has permanently blended the cream into the milk.

The heart of a homogenizer is a porous cone formed of crimped stainless steel wire through which the milk is forced at high pressure.

Ordinary wire couldn't take the combination of tight crimping and severe forming without fracturing. And it was too unstable to avoid matting and distortion under the processing pressure.

National-Standard research teams solved each of these problems so that the dairy industry could have better homogenizing equipment. And we stand ready at all times to work on any problem that will give *you* better and more versatile products made from wire, wire cloth or steel strip. Call us and see.

NS NATIONAL-STANDARD Company NILES, MICHIGAN

NATIONAL-STANDARD COMPANY • NILES, MICHIGAN
Tire Wire, Stainless, Fabricated Braids and Tape
ATHENIA STEEL DIVISION • CLIFTON, N. J.
Flat, High Carbon, Cold Rolled Spring Steel
REYNOLDS WIRE DIVISION • DIXON, ILLINOIS
Industrial Wire Cloth
WAGNER LITHO MACHINERY DIVISION • JERSEY CITY, N. J.
Special Machinery for Metal Decorating
WORCESTER WIRE WORKS DIVISION • WORCESTER, MASS.
Round and Shaped Steel Wire, Small Sizes

"THAT'S OUR STEEL STOCKROOM"

The gentleman is referring to the Carpenter Mill-Branch Warehouse in his locality. Have you ever thought about making your nearest Carpenter Warehouse *your* steel stockroom, too?

When you do, you'll make the profitable discovery that your Carpenter Mill-Branch Warehouse not only carries stocks of specialty steels . . . but puts at your command one of the most comprehensive services on steel ever devised.

And *every* service is designed to free you from more of your steel problems . . . lets you concentrate on your one important job of making *more* and *better* products at a lower unit cost.

There's the man on the warehouse order desk ready to give quick information on sizes, prices and grades. There's professional in-the-shop help on tooling and production problems . . . service literature to help you get the most from every pound of steel you use . . . as well as Metallurgical Counsel available to you direct from the Reading Mill.

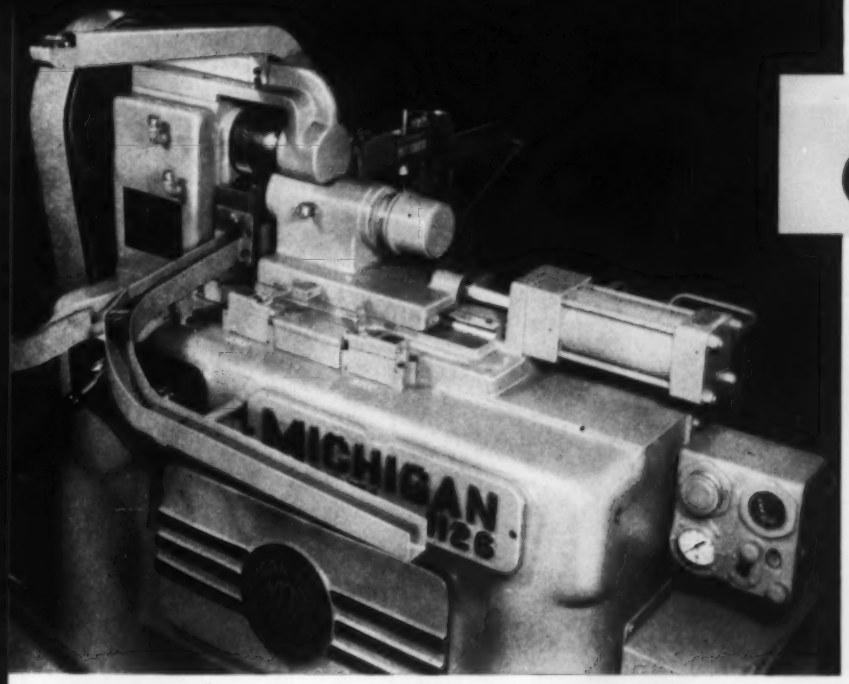
Give your nearest Carpenter Mill-Branch Warehouse or Distributor a chance to prove how this comprehensive Mill-Branch Warehouse Service can pay off for you. Simply pick up your phone, call the number and be ready for action! The Carpenter Steel Co., 139 West Bern St., Reading, Pa.

Carpenter STEEL — **Mill-Branch Warehouse Service**

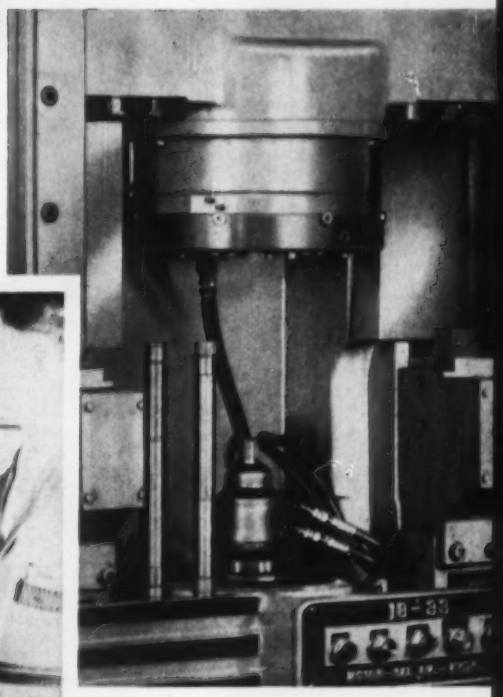
SPECIALTY TOOL • ALLOY and STAINLESS STEELS

This Month's

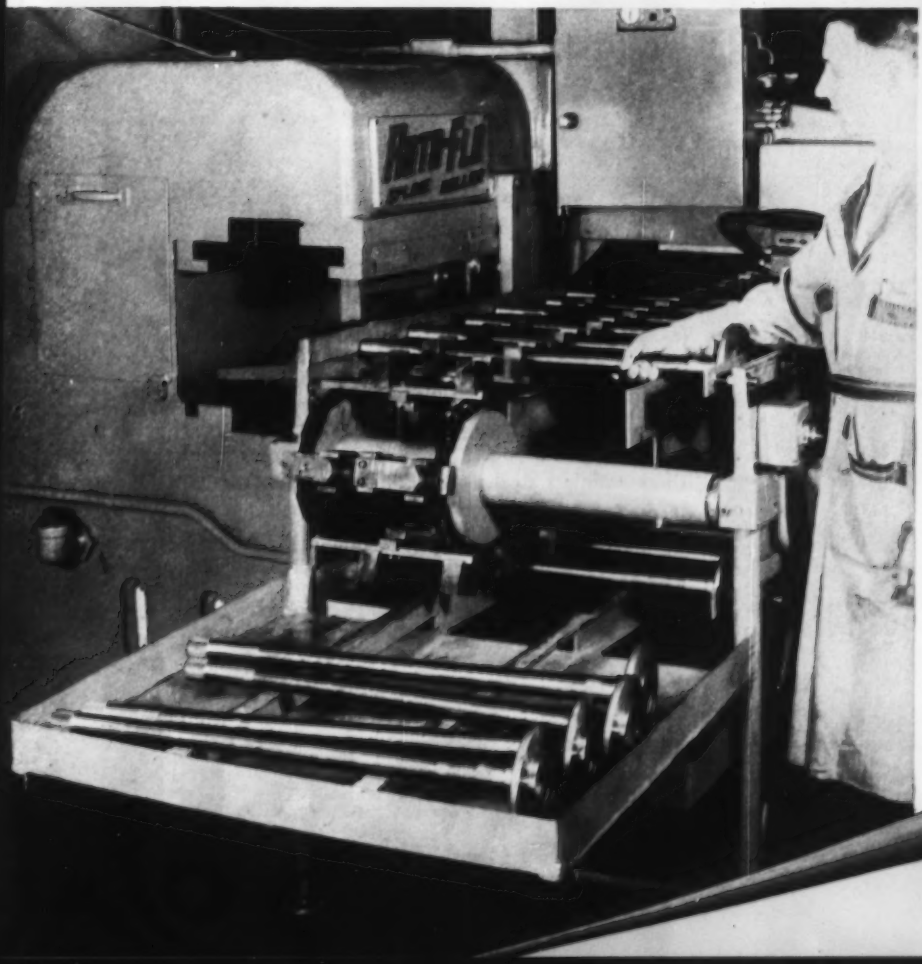
GEAR PIX



AUTOMATED SPEEDER...facilitates speeding of production gears in mesh with an accurate master or a master mating gear. Inspector places gears to be speeded in the chute, and flicks a lever to divert any rejects that exceed sound level requirements. Cycle time on helical gear shown is 6 seconds.



12 & 15 SECONDS, respectively, is the cutting cycle time for the ⅞" and 1¼" width splines on an 18-33 Shear-Speed gear shaper. The 28-tooth, 24-pitch splines are formed on a relatively thin-walled hollow shaft adjacent to bearing surfaces.

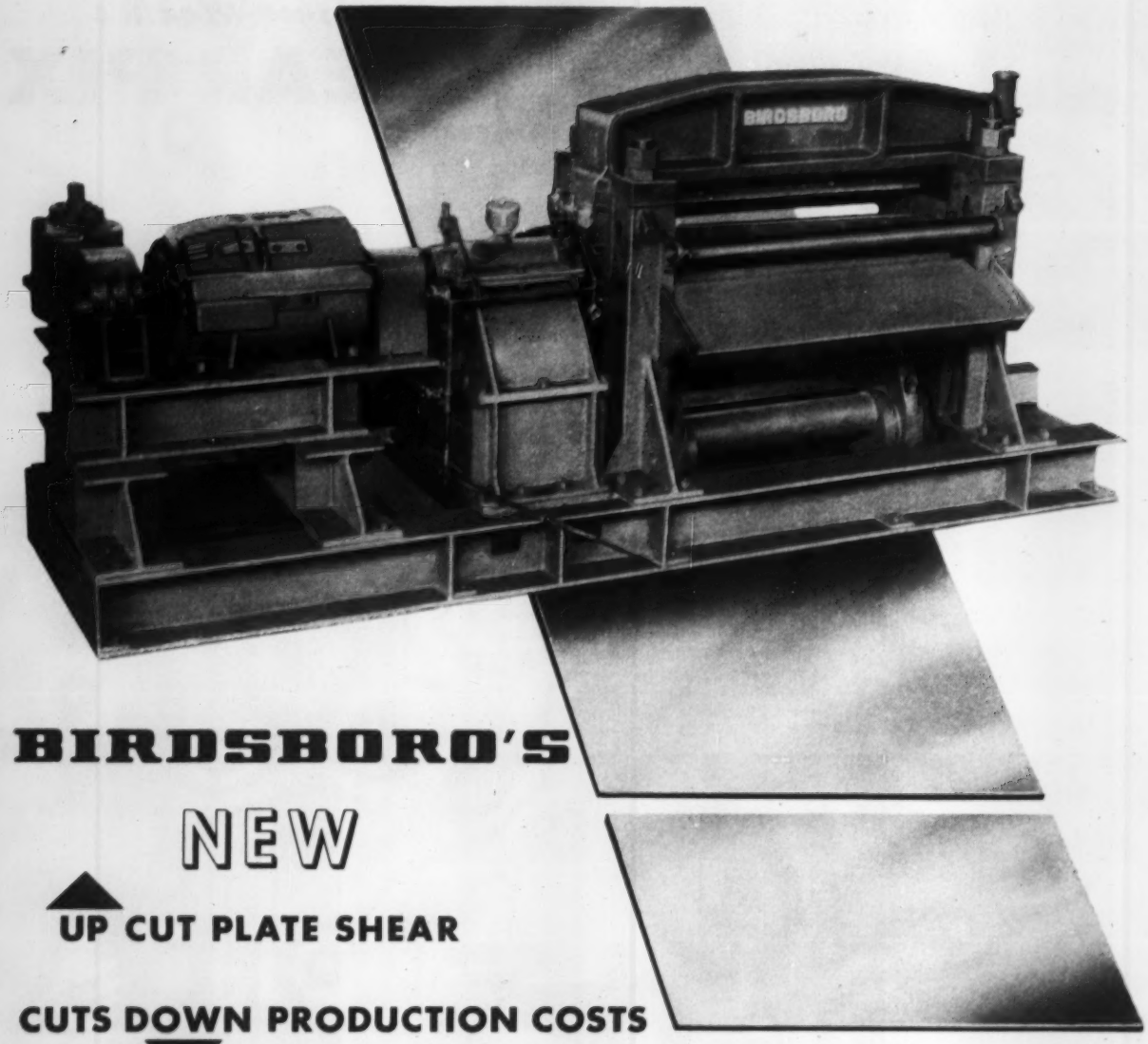


SPLINES ON AXLE SHAFTS cold formed automatically on the Roto-Flo spline roller. This will be on exhibit at the Machine Tool Show.

MICHIGAN TOOL COMPANY

7171 E. McNICHOLS RD. • DETROIT 12, MICH.

IN CANADA: COLONIAL TOOL CO., LTD.



BIRDSBORO'S NEW UP CUT PLATE SHEAR

CUTS DOWN PRODUCTION COSTS

Designers and Builders of:
STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
SPECIAL MACHINERY
STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

• Talk about a *tough* cutting job! 175,000 lbs. shearing strength is required to bite through ⅛″ thick stainless steel plate up to 62″ wide. BIRDSBORO helped supply the answer . . . with a new start-stop type of Up-Cut Plate Shear. Special provisions protect the lower knife slide from scale contamination. Producing new type shears is an old story for BIRDSBORO. For over a half-century, BIRDSBORO service has been handled by a series of design, engineering and production experts who can produce machinery to fit any of your requirements.

MM-45-55

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

THIS IS INLAND STEEL!

The Cities Service Heat Prover Works Here

THE PORTABLE HEAT PROVER is supplied and maintained free by Cities Service. It helps control combustion efficiency by allowing rapid, continuous sampling, simultaneous readings and direct measurement of oxygen and combustibles. Inland uses the Heat Prover for its blast furnaces, open hearths, soaking pits, continuous galvanizing line, reheat furnaces, purging operations, annealers, and boilers on ore ships.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

FOUND by these manufacturers THAT

BLISS
E. W. Bliss Company
BOOTH #1414

BRYANT
Bryant Chucking Grinder Company — BOOTH #1015

CMC CLEARING USI
Clearing Machine Corp.
BOOTH #716

CLEVELAND
The Cleveland Automatic Machine Co. — BOOTH #412

CONSOLIDATED MACHINE TOOLS
Consolidated Machine Tool Co. — BOOTH #217

EDLUND
Edlund Machine Co.
BOOTH #115

famco
Famco Machine Company
BOOTH #507

FEDERAL PRESS
Federal Press Company
BOOTH #801

FOSDICK
The Fosdick Machine Tool Co.
BOOTH #1402

FOX
Fox Engineering Company
BOOTH #419

GALLMEYER & LIVINGSTON
Gallmeyer & Livingston Company — BOOTH #906

GREAVES
Greaves Machine Tool Co.
BOOTH #721

speeds installation of any machinery
protects accuracy of precision machines

These machine tool builders cut set-up time at the Machine Tool Show from hours to minutes with BARRYMOUNT® Leveling Isolators. No drilling floors, no setting lag bolts, no shimming — they just set their machines on the Barry mounts, adjusted the leveling screws, and the normally tedious, costly job was done.

This is not just a show trick — it's a standard efficiency procedure for new installations and re-installations in large and small plants all over the country. And, *at the show or in your plant,* the isolation built into Barry mounts protects precision machines against vibration from nearby heavy equipment.

At the National Metal Exposition in Philadelphia, you will find Barry engineers at Booth 2062, ready to show you how you can simplify installation, protect machine accuracy, prolong machine life, and cut maintenance costs with Barry Machine Mounts.

BARRY CONTROLS
INCORPORATED
926 PLEASANT STREET WATERTOWN 72, MASS.
SALES REPRESENTATIVES IN ALL PRINCIPAL CITIES

JOHNSON
Johnston Machine & Press Corp.— BOOTH #411

KINGSBURY
Kingsbury Machine Tool Corp.
BOOTH #915

PRECISION PRODUCTION THROUGH MICRONOMICS
MICRO MATIC
Micromatic Hone Corporation
BOOTH #1211

MOLINE
Moline Tool Company
BOOTH #1304

Monarch
TURNING MACHINES
The Monarch Machine Tool Co.
BOOTH #920

THE MOTCH & MERRYWEATHER MACHINERY CO
The Motch & Merryweather Machinery Co.—BOOTH #606

Onsrud
Onsrud Machine Works Inc.
BOOTH #812

RACINE
Racine Hydraulics & Machinery Inc.
BOOTH #102

SHEFFIELD
The Sheffield Corporation
BOOTH #1305

Van Norman
Van Norman Company
BOOTH #905

WIEDEMANN
Wiedemann Machine Co.
BOOTH #1420

"Steel scientists are finding increasing evidence that nitrogen . . . is a valuable alloying element in developing new steels for jets, gas turbines, and atomic energy applications."

NEW!

A Better Way of Introducing Nitrogen Into Steel

NITRELMANG®

Now available! A new product by the pioneer producer of electrolytic manganese. NITRELMANG® . . . a stable nitrided ELECTROMANGANESE® produced in two grades, containing 5¾ or 4½% of nitrogen.

Excellent results are reported by several companies who are using this new product for introducing nitrogen into alloy steels.

Now available for prompt delivery in commercial quantities. For further information and prices write Dept. N-1.

REG. U. S. PAT. OFF.

Electro MANGANESE CORPORATION
BOX 479 KNOXVILLE, TENNESSEE

This New B&W Hollow Forgings Bulletin ...gives comprehensive data on an unusual subject

Fully detailed, with charts, photographs, tables and text, this just-published bulletin provides a broad coverage of what, very often, is both an engineering and procurement problem.

Its contents include:

- Specifications
- Materials Reference Table
- The Hollow-Forging Manufacturing Process in Pictures
- Photomicrographs of Castings and Forgings
- Sizes — Carbon, Intermediate Croloys and Austenitic Stainless
- Analyses of Standard Hollow-Forgings Alloys

For ready and complete Hollow Forgings reference, send for Bulletin S-16B to The Babcock & Wilcox Company, Process Equipment Department, Barberton, Ohio.

BABCOCK & WILCOX
BOILER DIVISION

S-444

Q: *Why do the Largest Users of* AMERICAN PHILLIPS *Screws use more of them every year?*

A: *Because the more they use . . . the more they* MULTIPLY PROFITS

Many of the best-known names among U. S. hardgoods manufacturers have used Phillips Recessed-Head Screws ever since American first introduced them to industry.

And for one good business reason: All factors considered, American Phillips Screws cost less than any other fastening method . . . because they're easier to handle, faster to drive, non-skid and slash-proof.

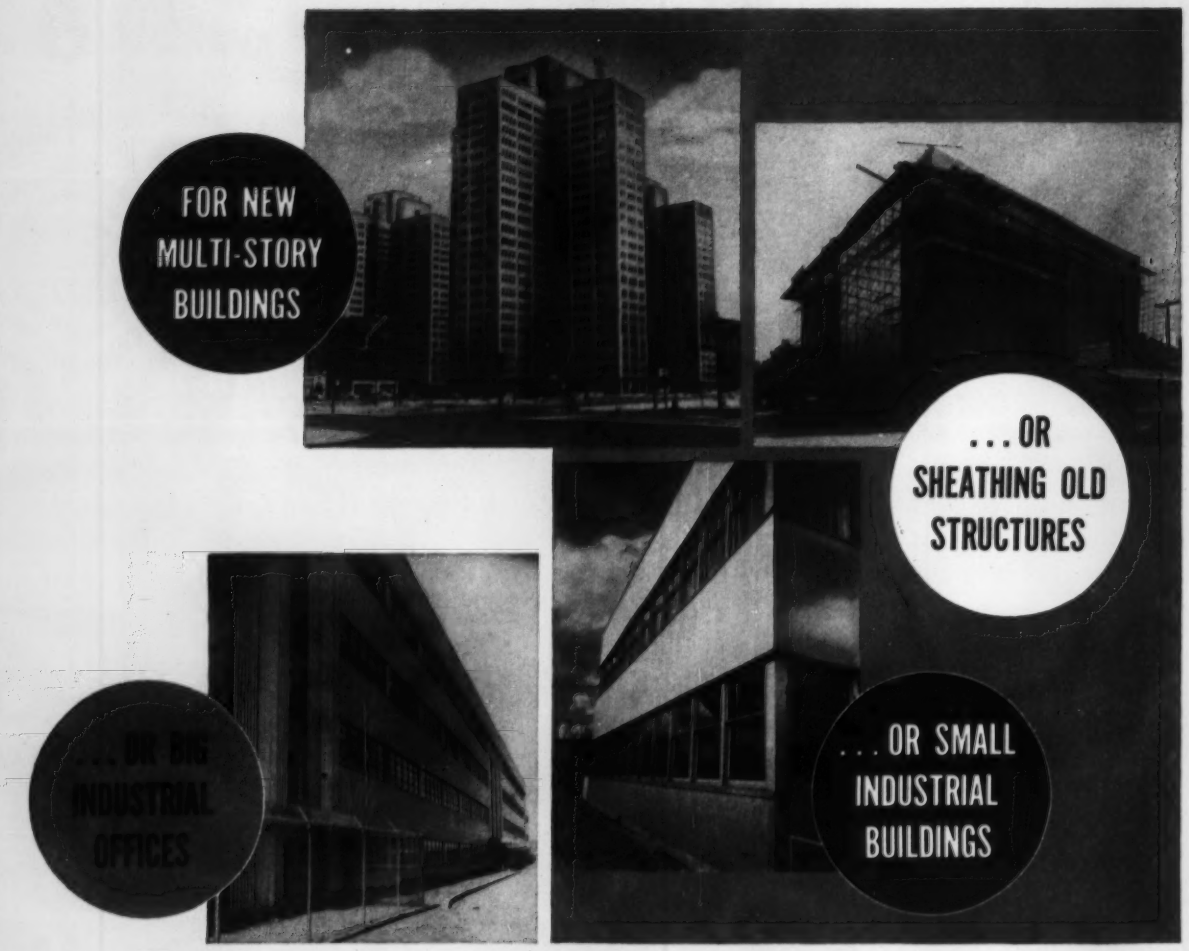
In fact, American Phillips Screws are one of the most effective means of cost-control available to you today. Prove this out for yourself . . . American engineers will help you make a thoroughgoing economy test, right in your own plant.

✕ *marks the spot . . . the mark of extra quality*

AMERICAN SCREW CO.

PHILLIPS HEADquarters
WILLIMANTIC, CONNECTICUT

Plants at Willimantic, Conn. and at Norristown, Pa.
Warehouse and office at Chicago
Office, Detroit, Michigan



STAINLESS CURTAIN WALLS

give you the best "long pull" investment

"INFO" for Architects and Builders

1. "AL Structural Stainless Steels"—12 pages on stainless grades, properties, forms, finishes, standard "specs," uses and advantages.
2. "Stainless Steels for Store Fronts and Building Entrances"—40 pages of valuable data on examples and details. AIA File No. 26D.
3. "Stainless Steel Curtain Walls"—A 24-page progress report on methods. AIA File No. 15-H-1.

Write for Details

Address Dept. S-691

Curtain wall panels faced with Allegheny Metal have *all* the advantages. They can give your building the truly modern look. They have a soft, highly attractive luster and permit wide latitude in design for individual appearance. They're light and strong . . . can be used for sheathing or "face-lifting" operations on existing structures, as well as for any type or size of new commercial building or institution.

Compared to brick or masonry construction, stainless curtain walls present savings at every turn: in lighter foundations; in enlarged floor space; in fast all-weather erection; in reduced maintenance, easy cleaning and freedom from painting. And—*compared to any other curtain wall facing material*—stainless steel is the hardest, strongest and most resistant to smoke, fumes, weather, wear, etc. It is the one material that can best take a beating . . . that costs the least in the long run because it lasts the longest.

Our Engineering and Research Staffs, etc., are at your service—anywhere, anytime. ● Let us work with you. ***Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.***

Make it BETTER-and LONGER LASTING with Allegheny Metal

AL® TIME-TESTED STAINLESS STEEL

WAD 8208 a **Warehouse stocks carried by all Ryerson steel plants**

A 48 x 36 Cecostamp is making road signs, metal ceilings, auto body parts, roofing trim and grain bins at an up-to-date metal stamping concern in Canada.

Formerly made on a rope drop hammer, these stampings as produced on the Cecostamp are sharper and more distinct, production has been increased up to 10% and rejects have been greatly reduced, saving time and material. Operation is also easier and safer.

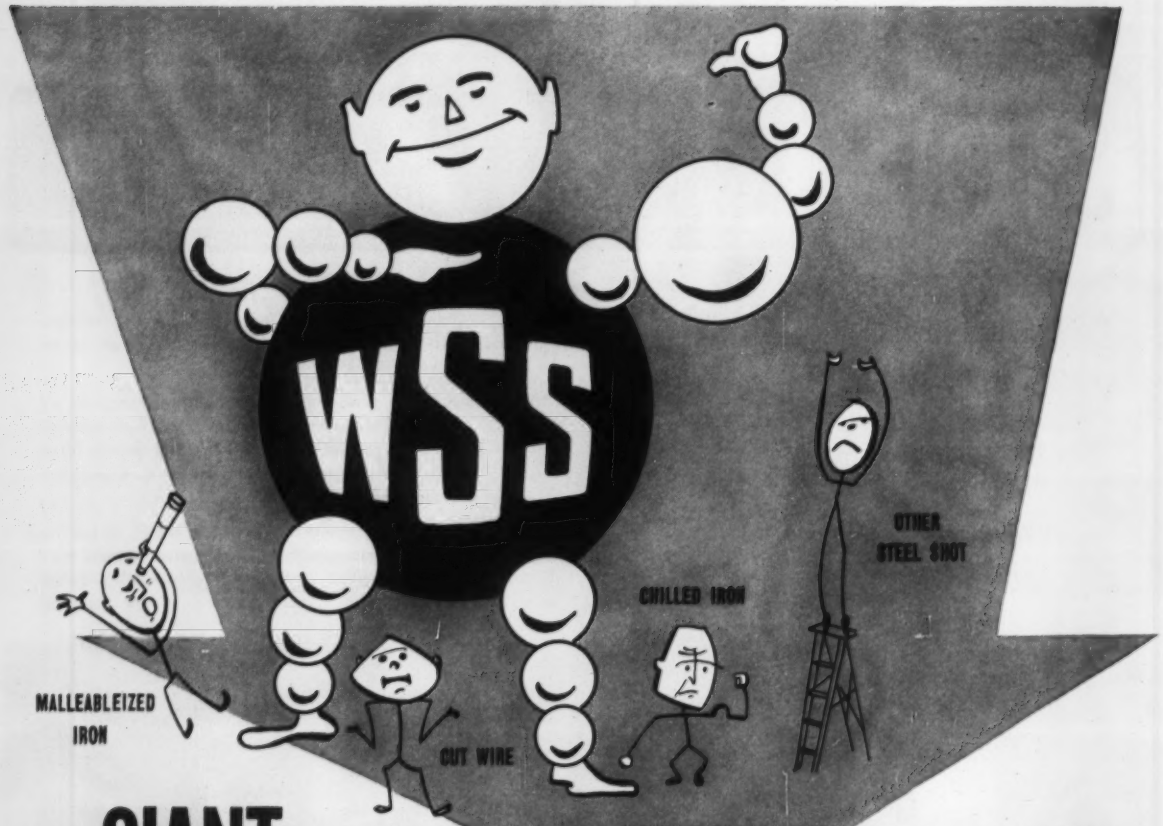
Have you a stamping problem that might be solved by installing Cecostamps? Investigate this air-operated impact type drop stamp, using blows of controlled intensities, the control being completely and instantly at the will of the operator.

Write for a copy of our latest Bulletin No. 30-L-5

Above are a few of the familiar road signs produced on the versatile Cecostamp.

CHAMBERSBURG CECOSTAMP

CHAMBERSBURG ENGINEERING COMPANY · CHAMBERSBURG, PENNSYLVANIA



For GIANT savings specify WHEELABRATOR® Steel Shot

You may not see the difference by looking at abrasives, but you can't miss the GIANT savings you make when you use Wheelabrator Steel Shot in your blast cleaning machine.

Look at the chart in this ad. These 4 firms have saved 25% to 60% on shot costs by using Wheelabrator Steel Shot. In 2 years over 1,000 firms have changed to Wheelabrator Steel Shot . . . 400 from other steel abrasives. Let Wheelabrator Steel Shot make GIANT savings for you. Start using it today.

COMPANY	COST COMPARISON		SAVINGS IN ABRASIVE COSTS
	MALLEABLEIZED IRON	WHEELABRATOR STEEL SHOT	
An Ohio Steel Foundry	$1.35/ton cleaned	$.57/ton cleaned	60%
A Chicago Malleable Foundry	$1.10/ton cleaned	$.60/ton cleaned	45%
	STEEL SHOT AND CUT WIRE	WHEELABRATOR STEEL SHOT	
A Steel Processing Plant	5.06 lb./ton cleaned	2.80 lb./ton cleaned	45%
A Cleveland Gray Iron Foundry	$.465/ton cleaned	$.25/ton cleaned	46%

Write today for Bulletin 89-B

World's largest builders of airless blast equipment

WHEELABRATOR
CORPORATION
(Formerly American Wheelabrator & Equipment Corp.)

509 S. Byrkit St., Mishawaka, Indiana

Trail Blazer of Industrial Progress

ALL-MAGNESIUM F-80C jet fighter promises huge savings to taxpayers.

Magnesium plane breaks through cost barrier!

Also faster, stronger, and simpler to produce.

You're looking at an experimental model of the USAF's famous F-80C jet fighter, built by Barium's East Coast Aeronautics, Inc., Pelham Manor, N. Y.

It doesn't *look* any different from other F-80C's—but the entire airframe is *magnesium*. Using this light but strong metal as structural material eliminated over 60% of the parts and fastenings originally required by the aluminum design.

Using fewer parts and fasteners not only saves material costs, but also reduces the cost of man hours for engineering, parts fabrication and assembly, and the design and manufacture of tools. And the magnesium plane is faster, stronger, and simpler to produce.

This impressive technical accomplishment by East Coast Aeronautics highlights again the hard-thinking, hard-working management and production team that has built Barium from a single company to 16 in only 10 years. And this alert organization produces a tremendously varied list of products—from massive steel bridge girders to plastic seats. You're invited to find out more about Barium's soundly diversified family of companies. Write for the Barium story. Barium Steel Corporation, 25 Broad Street, New York 4, New York.

16

INTEGRATED COMPANIES

BARIUM

STEEL CORPORATION

WORKING IN STEEL, ALUMINUM, MAGNESIUM, FIBERGLASS

Steel Producers

Chester Blast Furnace, Inc. (pig iron) • Central Iron and Steel Company • Phoenix Iron & Steel Co.

Steel Fabricators & Processors

Phoenix Bridge Company • Industrial Forge & Steel, Inc. • Globe Forge, Inc. • The Geometric Stamping Company.

Manufacturers of End Products

Clyde Iron Works, Inc. • Erie Bolt & Nut Company • Bayonne Bolt Corporation • The Cuyahoga Spring Company • Jacobs Aircraft Engine Company • Kermath Manufacturing Company • Kermath (Canada) Limited • Wiley Manufacturing Company

Lightweight Metal and Plastics

East Coast Aeronautics, Inc.

52

Four Of A Kind For Better Barrel-Finishing. The new Norton Tumblex "T" abrasive brings you an unbeatable combination for top performance: non-wedging triangular shape; fast-cutting bonded ALUNDUM* abrasive; and four sizes for the widest range of applications.

Brand new! . . . Norton TUMBLEX "T" — bonded, triangular shape tumbling abrasive

Users report Tumblex "T" abrasive brings many new "TOUCH of GOLD" benefits to barrel-finishing

Here's one of the most revolutionary barrel-finishing innovations ever developed. In typical on-the-job tests, Norton customers report that the new Tumblex "T" tumbling abrasive:

- ***"cuts tumbling cycle time from five hours to one hour."***
- ***"finishes steel and magnesium parts that could never before be barrel-finished."***
- ***"completely removes burrs from stainless steel parts in four hours. Abrasives previously used failed to do so in 12 hours."***

Everything about Tumblex "T" abrasive is designed for better barrel-finishing.

Its uniform triangular shape and size prevents wedging in recesses of parts.

Made of famous Norton ALUNDUM abrasive, it cuts fast, with no compound needed — resulting in shorter time cycles and lower costs per piece finished.

It provides maximum surface contact with parts being processed, assuring top quality work in fastest time.

It wears down evenly, keeping the same triangular shape. No small chips to lodge in holes, slots, etc. — and when worn down it can be used on parts requiring a smaller size abrasive.

Its lightness means less weight required to fill the barrel. Results are more uniform finish, without roll-in or roll-over of edges of parts.

Its chemical inertness, unaffected by acids, compounds or detergents, prevents spoilage common to other types of abrasive.

Send Your Work Samples

to our newly enlarged Sample Processing Department. Let us prove to you how the latest barrel-finishing equipment and techniques can improve your product quality and cut your finishing time and costs. NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone directory, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

G-294

NORTON

ABRASIVES

Making better products... to make your products better

NORTON COMPANY: Abrasives • Grinding Wheels • Grinding Machines • Refractories

BEHR-MANNING DIVISION: Coated Abrasives Sharpening Stones • Pressure Sensitive Tapes

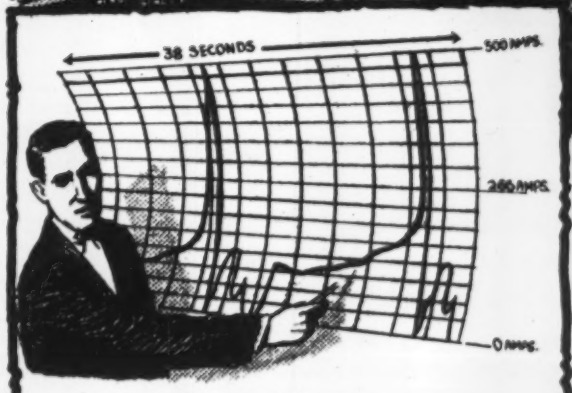
*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

FACTS ABOUT Exide®

IRONCLAD® INDUSTRIAL TRUCK BATTERIES

NO MOVING JOB IMPOSSIBLE!

STEEP RAMPS, LONG HAULS, HEAVY LOADS... NO JOB IS IMPOSSIBLE WHEN ELECTRIC TRUCKS ARE POWERED WITH IRONCLADS. EXIDE MAKES BATTERIES WITH ADEQUATE CAPACITIES TO KEEP TRUCKS WORKING FULL-SHIFT...WITH NO LET-DOWN IN TRUCK POWER OR PERFORMANCE. USER COST RECORDS SHOW THAT EXIDE-IRONCLADS ARE YOUR BEST POWER BUY— AT ANY PRICE!



PORTRAIT OF AN EXIDE WORKING

IN JUST TWO MOVES AND 38 SECONDS A FORK TRUCK MAY DRAW ENERGY FROM ITS BATTERY IN THIS PATTERN, IN RESPONSE TO 44 SEPARATE CONTROLLER OPERATIONS. IN AN 8-HOUR SHIFT, 3000 SUCH DEMANDS MAY BE MADE. EXIDE-IRONCLADS ASSURE RAPID, ACCURATE HANDLING OF MATERIAL... THEY RESPOND INSTANTLY TO THESE RAPIDLY RECURRING DEMANDS FOR HIGH POWER FOR SHORT DURATIONS.

TUBES OF POWER WORK FOR YOU INSIDE AN IRONCLAD

SLOTTED TUBES INSIDE AN IRONCLAD KEEP ACTIVE MATERIAL IN FIRM CONTACT WITH CONDUCTING GRIDS OF THE POSITIVE PLATE...THIS GRID PROTECTION LENGHTENS THE LIFE OF THE BATTERY. SLOTTED TUBES EXPOSE MORE ACTIVE MATERIAL TO THE ELECTROLYTE... FOR GREATER POWER. FINE TUBE SLOTS HOLD MATERIAL IN CONTACT WITH GRID LONGER...RESULT, THE IRONCLAD'S ABILITY TO DO YOUR MATERIALS MOVING JOB FOR A LONGER PERIOD OF TIME. THAT IS WHY EXIDE-IRONCLADS ARE YOUR BEST INDUSTRIAL TRUCK BATTERY BUY— AT ANY PRICE!

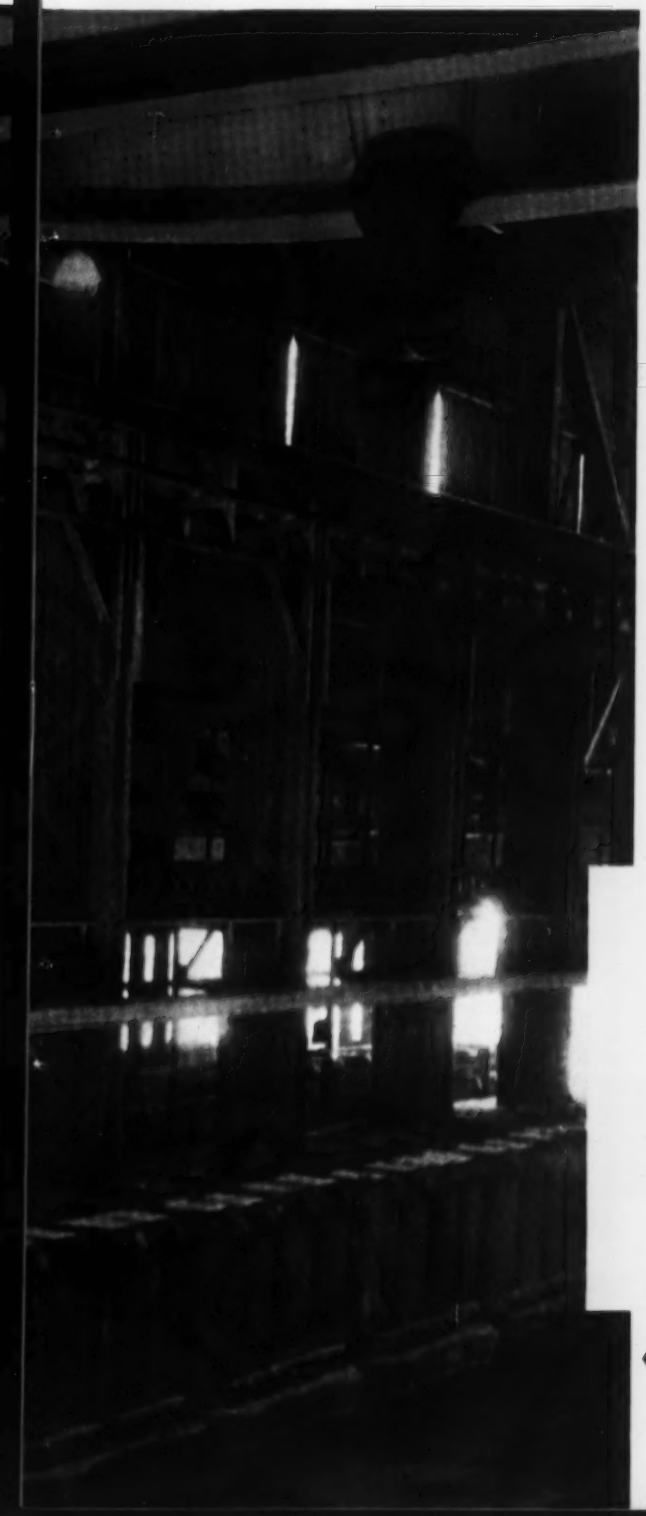
LET EXIDE HELP SOLVE YOUR INDUSTRIAL TRUCK BATTERY PROBLEMS. ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ❷ WRITE FOR FORM 1982, A MANUAL ON INSTALLING AND MAINTAINING MOTIVE POWER BATTERIES.

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

For Youngstown Sheet & Tube . . .

KOPPERS designed and

engineered 8 new open hearths



A SIGNIFICANT PHASE of the recent expansion of steel-producing capacity by The Youngstown Sheet & Tube Company was the addition of a new open-hearth shop at its Indiana Harbor plant.

This open-hearth shop, with eight furnaces, was designed and engineered by the steel plant specialists of Koppers Freyn Department, who also engineered the installation of a complete slabbing mill at this plant during the same expansion program.

Design of the main open-hearth furnace building would permit the eventual addition of four more furnaces, if needed.

Shop layout includes a hot metal transfer station, utilizing 150-ton mixer-type ladles and 100-ton transfer ladles, located in a 216 by 85 ft. area at one end of the building.

The charging aisle proper extends for an additional 1,080 ft. The furnaces are spaced at intervals of 108 ft. and an additional 54-ft. bay is provided at the center of the shop.

The furnace design is of interest in that in addition to end chill boxes, additional hearth cooling space is provided throughout the length of the furnace.

Each of the furnaces in the efficient new shop is rated at 225 tons of ingots per heat, but is regularly averaging more than 275 tons. Rated annual ingot-producing capacity for the eight furnaces is in excess of 1,600,000 net tons.

Designing and constructing open hearths is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers. You are invited to consult with our Engineers and Management.

KOPPERS®

Engineering and Construction Division

FREYN DEPARTMENT

KOPPERS COMPANY, INC., PITTSBURGH 19, PENNSYLVANIA

◀ Pouring aisle, one of the widest in the world, at Youngstown Sheet & Tube's new open-hearth shop.

FALLACIES AND FACTS FOR CARBIDE BUYERS

"Equivalent Grade" charts can mislead carbide users

Another blunt — but necessary — clarification by the manufacturer of Carboloy cemented carbides shows how these charts fail to disclose important facts.

Charts purporting to be "Equivalent Grade" or "Industry Standard" carbide comparison tables are now being liberally distributed in the metalworking industry. *Both titles are misnomers.*

Those who advocate their use claim or imply that:

1. These charts prove that a purchaser can safely interchange grades made by a number of manufacturers and get equal results on a given job.
2. These charts were compiled as a joint effort by all carbide manufacturers.

Neither statement is entirely factual.

THE FACTS ABOUT CLAIM NO. 1

The so-called "Equivalent Grade" charts are an attempt to convince carbide purchasers that any of the grades listed for a particular job will perform equally well. *This is not in accord with the facts.*

No two carbides are exactly alike in over all performance. Their production abilities vary tremendously because of differences in composition, metallurgical structure, manufacturing techniques, and quality control. For example, Carboloy Grades 883 and 44A have identical chemical composition. Yet because they are completely different structurally, they cannot be used as "equivalents."

Because no two carbides are exactly alike in performance, attempts to force them into arbitrary cubbyholes on the charts lead, inevitably, to poor machining results. The weakness of using the charts to select "equivalent" grades is easily demonstrated by two examples:

1. Carboloy manufactures four different cast-iron cutting grades to handle various conditions. Several other manufacturers have one or two grades to cover the same range. Now it is quite possible that competitive grades might work out in general, but in the specific areas covered by our four grades, *they would not provide optimum performance.* Yet all the grades are in the same classification on the charts . . . with no attempt made to distinguish their particular advantages.

2. Carboloy's new steelcutting Grades 350 and 370 do not fall under *any* of the general chart classifications. If included at all, Grade 370, for example, is usually placed under the designations "C-5" and "C-6." Yet we know from experience that Grade 370 will give far longer tool life than our Grade 78B, *which has the same classification numbers.* Obviously, the two grades are not in the same category in terms of production ability. Yet the charts would lead purchasers to believe that they are "equivalent."

THE FACTS ABOUT CLAIM NO. 2

Despite anything to the contrary, these charts were not compiled as a joint effort by all carbide manufacturers.

Obviously, every carbide manufacturer should recommend the types of cutting applications each of his grades is designed to handle. This is part of his responsibility to the customer.

However, as far as the Carboloy organization is concerned, our recommendations stop with giving data about our own grades. We have compiled test and case-history information on them. We know exactly how they will perform. But we are not in the position to give similar data on other manufacturers' grades — nor is anyone else better qualified than ourselves to give data on our grades.

But several other carbide manufacturers have decided, apparently, to assume this responsibility. Their compilations — under the title of "Equivalent Grade" or "Industry Standard" charts — are now being widely circulated in the trade. The use of these titles may lead the carbide buyer to believe that the chart has been agreed to by all manufacturers. This emphatically is not the case.

AND, THE GREATEST FALLACY

Unlike steel, which can be changed somewhat by heat-treating or other operations after it is delivered, the properties of carbides cannot be altered.

This means the purchaser should know exactly what he is buying . . . and that he should insist on a carbide with consistent production ability.

The important factor of consistent operation is not covered in *any way* by the so-called "equivalent charts." And this, we feel, is perhaps the most important fact not brought to the attention of the carbide user who relies on the charts when specifying grades for his job.

"Carboloy" is the trademark for products of the Carboloy Department of General Electric Company

CARBOLOY
DEPARTMENT OF GENERAL ELECTRIC COMPANY
11141 E. 8 Mile Blvd., Detroit 32, Michigan

Carboloy Created-Metals for Industrial Progress

NEW... AMERICAN MONOTRACTOR for Automatic Handling

The NEW American MonoTractor will fit precisely into any overhead handling system for automatic transfer of materials.

This new unit offers these advantages:—

1. Duti-Rated Life Time Gearing.
2. Speed Range from 35 to 350 F. P. M.
3. Horsepower Range for ¼ to 2 H.P.
4. Any Standard NEMA Motor.
5. Any Type Motor Brake Can Be Applied.
6. Operates on Any Smooth Flat Flange Track.

This precision built tractor unit offers continuous trouble-free transfer of any type of carrier for power propulsion. American MonoRail engineers offer wide experience in the application of these units. Let them help you solve your automatic handling problems.

AMERICAN OVERHEAD HANDLING EQUIPMENT

AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE • CLEVELAND 7, OHIO

[IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.]

AMERICAN
WELDING

STEEL

September 26, 1955

Metalworking Outlook

Coming Up

"An excellent year." That's a prediction for 1956 by Arthur Dietz, president of CIT Financial Corp. He estimates the auto industry will sell "more than 6 million" new cars next year. Highway construction is expanding at local, county and state levels. He adds: "The durable goods industries are projecting record spending for plant and equipment. And other industries are also in good shape."

Railroad Revenues

Here's why railroads are stepping up their equipment buying plans: They figure they'll take in 7 per cent more money this year than they estimated just a few months ago. The new estimate of net railway operating income for 1955 is $1040 million. In June, they thought it would be $973 million, compared with $875 million for 1954. The higher revenues would be comparable to income in 1952 and 1953, both good years.

Skirmish on Transport Policy

A preliminary skirmish on a national transportation policy was staged last week. The main battle comes in 1956, with the next session of Congress. The Harris subcommittee of the House Interstate Commerce Committee held hearings through Sept. 22 on the sweeping legislative changes called for in the report by the President's Advisory Committee on Transport Policy & Organization. Administration spokesmen endorse the report and charge that the Interstate Commerce Act, its amendments and its interpretations: 1. Fail to give effect to strong competitive forces. 2. Have subjected the different types of transportation to uneven degrees of service obligations and economic restraints.

Bigger Coal Companies?

Look for many new consolidations in the coal business. So says Cyrus Eaton, the Cleveland financier who has just merged the West Kentucky Coal Co. and Nashville Coal Co. into the nation's third largest coal firm. He also foresees new marketing policies and management techniques more in keeping with the big-business style of American industry. The money needed for research and equipment required to get the industry more competitive with other fuels can only be found in big operating units, he believes. Mr. Eaton expects more coal to be exported and greater markets to be found in coal by-products.

Air Conditioned Industry

Practically all new plants being built by 1960 will be completely air conditioned, predicts G. K. Iwashita, general manager of General Electric Co.'s commercial and industrial air conditioning department. Only 15 or 20 per cent of new industrial construction today includes air conditioning. A survey of New York metropolitan area plants, he says, showed that hot

Technical Outlook—p. 111 Market Outlook—p. 159

weather resulted in an annual production loss averaging $108 per employee. The survey indicated that 100 days each year were so hot or humid that production slowed down.

Revision on Refunds

The Defense department after Oct. 1 will change its incentive and price-revision contracts. The move will eliminate the need for large refunds which contractors sometimes have to make after retroactive final determination of prices. All contracts of those two types will provide that the "aggregate total payments on such contracts shall not at any time exceed 105 per cent of total costs incurred as of any given date, prior to the negotiation of firm and finalized prices."

Talk About Merger

Both Youngstown Sheet & Tube Co. and Bethlehem Steel Co. are anxious to have their merger consummated, but legal hurdles still stand in the way. That's what J. L. Mauthe, Sheet & Tube's president, told the Cleveland Society of Security Analysts. In the meantime, Sheet & Tube is going ahead with expansion plans in line with BDSA requests for 150 million tons of ingot capacity by 1960. Mr. Mauthe sees no indication of a dip in steel demand in 1956.

Generated by Research

A U.S. firm finds that for every dollar spent in research it ultimately derives $36 in sales. It also finds that for every dollar spent in research a profit of $7.20 before taxes is developed. Still another company finds that every research dollar ultimately leads to a $3 expenditure in new plant and equipment.

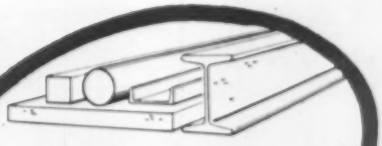
Help to Colleges

Take a long look at the new National Merit Scholarship Corp. It may fit into your company's college aid plan. Ford Foundation gave NMSC $20 million. Carnegie Corp. provided $500,000. NMSC will set aside $8 million to match any four-year donations by private groups or companies. The organization hopes to spur corporate gifts to colleges, find and aid bright students with scholarships and help capital-starved colleges.

Straws in the Wind

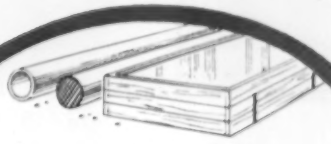
Some Canadian firms are considering buying American companies to provide easier access to the U.S. market . . . Canada's gross national product rose to a record annual rate of $26.2 billion in the second quarter . . . Chrysler Corp. plans a ten-year expansion program that includes construction of about seven regional plants—four to turn out Plymouths and the rest for the corporation's other cars . . . By Oct. 1, Ford Division of Ford Motor Co. will have expanded its annual car capacity by 250,000 or some 15 to 20 per cent more than a year earlier . . . Sales of General Electric Co. may establish a record this year, says President Ralph J. Cordiner; the company's top year thus far was 1953 when volume reached $3.1 billion.

call Ryerson for steel



CARBON STEELS

Hot rolled and cold finished bars; channels, angles, beams, etc.; plates of every kind.

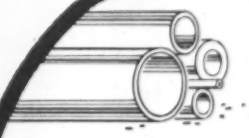


STAINLESS STEELS

World's largest stock of sheets, plates, bars, pipe, tubing, fittings, etc.

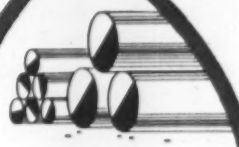
SHEET AND STRIP

Over 20 kinds and many gauges—in pattern sizes or cut to your order.



TUBING

Mechanical and pump cylinder tubing, seamless and welded; hydraulic fluid line and boiler tubes; structural tubing, etc



ALLOY STEELS

Tested alloys of known hardenability, standard and aircraft quality, as rolled, annealed, heat treated.

Quick delivery from nation's largest stocks

Need steel in a hurry? Ryerson stocks are the nation's largest, so one call to your nearby Ryerson plant brings quick delivery of almost any kind of steel in almost any quantity—all of it certified for high uniform quality.

Do you want your steel prepared for immediate use? Ryerson facilities include the most modern close-tolerance equipment for sawing, shearing and flame cutting to your specifications.

Of course, current heavy demand makes it difficult to keep all sizes always on hand but our stocks are being replenished continuously. Steel that's out of stock today may be in stock tomorrow. And experienced Ryerson steel men will help you make the most of steel on hand. So for everything in steel and steel service . . . call Ryerson.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

for your day-by-day requirements

RELIANCE
Job-Fitted
READY-TO-USE
SHEET and STRIP STEEL

1955			SEPTEMBER			1955
SUN	MON	TUES	WED	THURS	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Can we be useful to you?

RELIANCE STEEL
DIV. DETROIT STEEL CORPORATION

Processing and Distributing Plants

CLEVELAND PLANT, CLEVELAND 27, O..VUlcan 3-3600
DETROIT PLANT, DETROIT 28, MICH...WEbster 3-5866
EASTERN PLANT, HAMDEN, CONN.....STate 7-5781
MIDWEST PLANT, CHICAGO 8, ILL.....CAnal 6-2442

Reliance Customer Representative Offices

Dayton, O., Des Moines, Ia., Grand Rapids, Mich., Indianapolis, Ind., Jackson, Mich., Milwaukee, Wis., New York, N. Y., Rochester, N. Y., St. Louis, Mo., Toledo, O., Worcester, Mass.

T.M. REG. U.S. AND CANADA
DEPENDABLE DAN

RELIANCE
Job-Fitted
PRODUCTS

COLD ROLLED STRIP STEEL
Coils • Cut Lengths • All Tempers

SHEETS
Cold Rolled • Hot Rolled • H.R. Pickled
Galvanized • Long Terne
Standard or Production Sizes
Sheared or Slit to Actual Working Dimensions

COPYRIGHT 1955 D.S.C.

for **"response-ability"**
in your high carbon strip job
try
DSC HIGH "C" SPRING STEEL*

In DSC High "C" Spring Steel (carbon content over .25% min. to 1.05% max.) you get the working properties of DSC STRIP. For example, close gauge tolerance, uniform temper and bright or satin finish—all depending upon your job requirements.

In addition, DSC High "C" Spring Steel gives you "*response-ability*." You can have the strip hard rolled untempered or spheroidized annealed. In that case, you heat treat your own "*response-ability*" or springiness into the part after it's formed.

The carbon content tells only part of the story. Just as important is the particular way we cold reduce the steel—and when the job calls for it, the particular way we anneal it.

How we make the steel doesn't really matter. The important thing is whether we can give you what you need, when you need it.

With this in mind, how about talking over your High "C" requirements with your nearest DSC Customer Representative? We'll welcome the chance to work with you . . . and that goes for any of our products whenever we can be helpful to you.

*HIGH "C" ROLLING RANGE
GAUGE—Up to about .156" (depending upon the analysis)
WIDTH—Up to about 22" (depending upon gauge)
TEMPERS—Hard Rolled Untempered or Spheroidized Annealed
FINISH—Satin or Bright
EDGES—Slit or Rolled
Coils or Cut Lengths

Customer Satisfaction is our No. 1 Job

DETROIT STEEL CORPORATION
GENERAL SALES OFFICE—DETROIT 9, MICHIGAN

DSC CUSTOMER REPRESENTATIVE OFFICES
Chicago, Cincinnati, Columbus, O., Dayton, O., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., New York, Richmond, Va., St. Louis, Toledo, Worcester, Mass.

DSC MILL PRODUCTS
Hot Rolled and Cold Rolled Sheets
Cold Rolled Carbon Steel Strip — Flat Cold Rolled Carbon Spring Steel
Low and Medium Carbon Manufacturers' Wire — High Carbon Specialty Wire
Aluminum Cable Strand Reinforcement — Rope Wire — Tire Bead Wire
Welded Wire Fabric

PICTURE YOUR PART OR PRODUCT AS A STAMPING

IN FURTHERANCE OF THE METAL STAMPING INDUSTRY

STAMPINGS

give your product strength and durability coupled with light weight and attractive design at low cost . . . For the names of dependable sources write to:

PRESSED METAL INSTITUTE • 3673 LEE ROAD, CLEVELAND 20, OHIO

Wilson's Word Curtain

On Feb. 13, 1942, Donald B. Nelson, then director of the War Production Board, called editors of this publication and other business magazines to Washington.

Washington planners, he said, were stumped. The "Golden" months in which America could have prepared for war were largely wasted. Only ten "Silver" months of the crucial year remained in which to stop the onrushing enemy. One tank or plane made in 1942 would be worth ten made in 1943.

Neither the bureaucrats nor the men with industrial experience in the WPB had the means to know what the nation's 184,000 industrial plants could make to win the war.

Only business publications reached all industry, and Mr. Nelson called them to spread the word about the importance of switching to war work immediately . . . to tell them what was needed and how to make it.

In 1942, and through the war, the publications maintained a line of communications for industry. They told where to get contracts, how to select materials and about improved production techniques—interpreted in terms of their particular readers. Strategic information was screened from the enemy.

American industry quickly built up armaments to match ten years of preparation by the enemy. Backed up by completely mobilized and fully informed industry, the Armed Forces of America and her Allies won the war.

Now the Department of Defense has issued new regulations asking industry to throttle information on: 1. Contract awards. 2. Vulnerable points within a plant. 3. Plans and details of expansion of equipment and facilities. 4. Production methods, techniques and equipment. 5. Figures on production and capacity. 6. Sources of semifinished products, components and supplies. 7. Power, utilities and transportation. 8. Plant security. 9. Research and development.

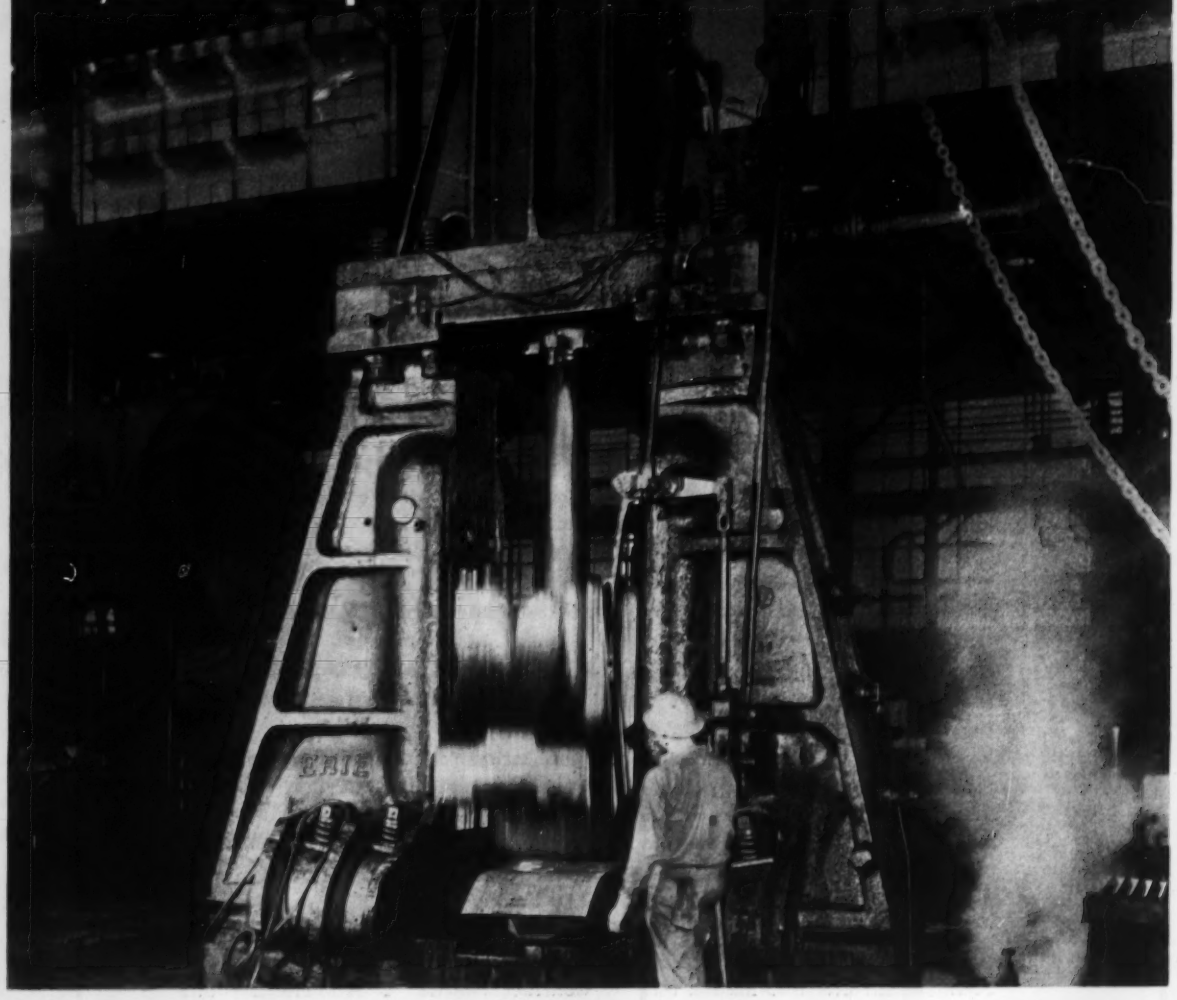
No one wants to give aid and comfort to a potential enemy, but Secretary Charles E. Wilson's directive is superfluous, objectionable and contrary to the public interest. This secrecy device could become a handy coverup for misdeeds and inefficiencies in government and the distortion of democratic principles.

Rep. John E. Moss (Dem., Calif.) is chairman of a House subcommittee to investigate suppression of information. You can reach him at the House Office Building, Washington 25, D. C. It's to your own interest.

Irwin H. Such

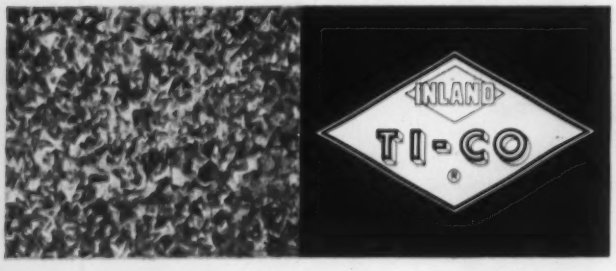
EDITOR

35,000-lb. drop-hammer fails to flake Inland TI-CO!



The ability of Inland's TI-CO galvanized steel to take punishment without flaking of the zinc coating was recently put to the supreme test. A sample sheet of TI-CO was slugged with a lethal blow from a 35,000 pound drop-hammer, one of the largest in the world. When the dust settled, the piece of TI-CO was carefully examined for any evidence of flaking. None was found! TI-CO took the blow in stride and the zinc coating stayed put!

Unlike ordinary galvanized sheets, the protective zinc coating on Inland TI-CO, produced by the patented Sendzimir process, will not crack, flake or peel when stamped, crimped, double-seamed, brake formed or even when formed by spinning. This flexible, uniform coating means that products made with TI-CO are easier and cheaper to produce because re-dipping after forming is eliminated. And they stay serviceable and good-looking longer, too!

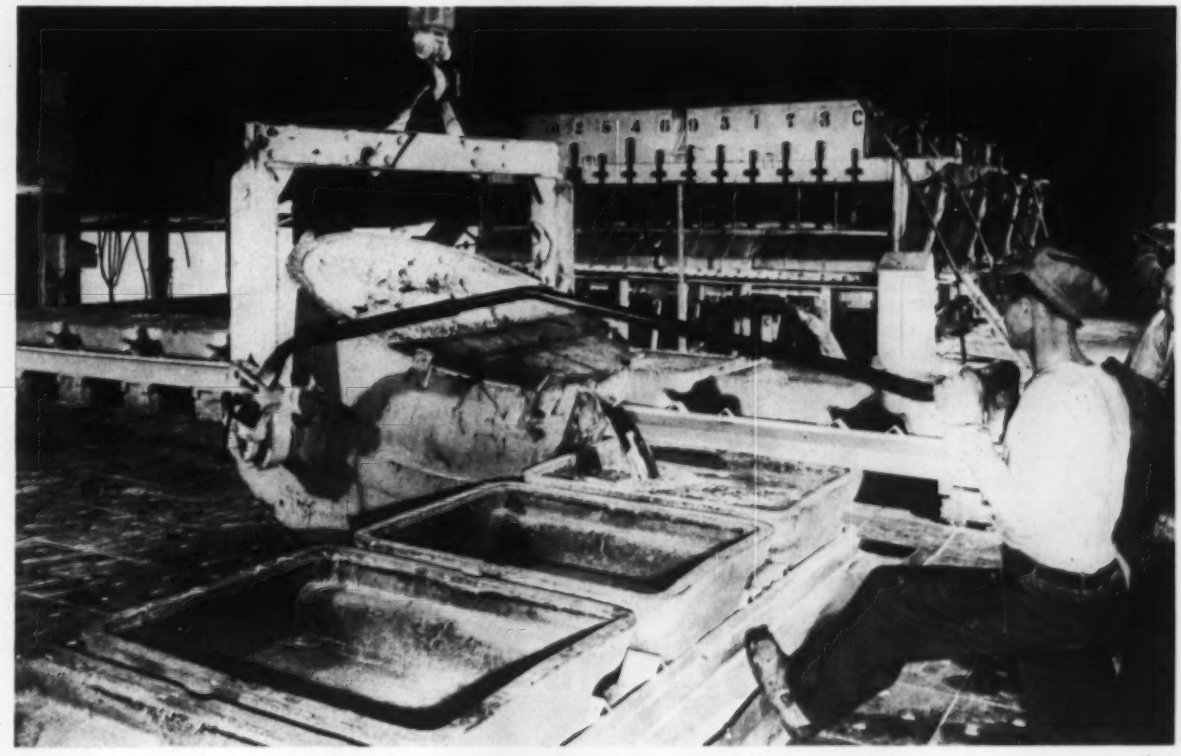


It will pay you to specify Inland TI-CO for all your galvanized steel requirements. INLAND TI-CO . . . with the zinc coating that rolls with the punch.

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport
St. Louis • Kansas City • Indianapolis • Detroit • New York



Alcoa

With demand pressuring existing pot lines . . .

New Aluminum Expansion Takes Shape

BY 1975, U. S. primary aluminum producers will have more than doubled their present capacity—from 1.5 to 3.6 million tons.

A step in this expansion is the move by Harvey Machine Co., Torrance, Calif., to become the nation's fifth primary producer, following Alcoa, Reynolds, Kaiser and Anaconda.

Growth—By 1960, at least seven companies will be in the business (Nos. 6 and 7: Revere Copper and Olin-Mathieson). If the government decides to grant fast amortization, there will be eight (or more) by 1975 (No. 8: A combine of St. Joseph Lead and Pittsburgh Consolidation Coal).

Dramatic growth of the industry in both output and number of companies is indicated by the fact that as recently as 1935 the lone producer, Alcoa, turned out under 60,000 tons of primary aluminum.

Light Metal Center — Built on low-cost coal power, the Ohio river valley area may emerge as the biggest single primary aluminum district in the U. S., second only in the world to Canada's Kitimat. Aluminum's dependence on hydroelectric power will be lessened as coal, lignite and natural gas power plants gain in efficiency.

Beginning about 1975, competitive atomic power will confirm the trend toward locating primary aluminum plants close to the market areas. Power for aluminum must be available at a top cost of 5 mills per kilowatt-hour. The latest A-power plant projected by Consolidated Edison of New York will generate power at 9 mills.

Skyrocket — Henry J. Kaiser, chairman and president of Kaiser Aluminum & Chemical Corp., Calif., points out: "Since 1940, shipments of aluminum have grown 780 per cent, against 17 per cent for copper and 59 per cent for steel."

Aluminum Co. of America estimates per capita consumption of aluminum at 25 lb. By 1975, says Alcoa, it will be up to 40 lb. Our population will be close to 220 million, the Bureau of Census predicts. Alcoa says that the auto industry alone has jumped its take to 30 lb per car this year. By 1970, the average will exceed 100 lb.

Summing Up—Says Keen Johnston, vice president of Reynolds Metals Co., Louisville: "New markets are opening up fast."

Two new markets: Reynolds' development of an aluminum oxide coating that replaces conventional electrical insulation in transformers; drawn aluminum

Primary Aluminum Capacity To Double

(millions of net tons)

1975*	3.6
1970	3.0
1965	2.5
1960	2.0
1955	1.5

*Estimated by STEEL, based on Paley Report

Already in the Works

(net tons)

Harvey Machine Co.	54,000
Aluminum Co. of America	32,000
Reynolds Metals Co.	35,000
	121,000

Proposed—Before 1960

(net tons)

Revere Copper & Brass Inc.	60,000
Reynolds Metals Co.	100,000
Kaiser Aluminum & Chemical Corp.	95 000
Olin Mathieson Chemical Corp.	60,000
St. Joseph Lead & Pittsburgh Consolidation Coal Co.	66,000
	381,000

for the "tin" can of the future.

Losing Battle—Primary aluminum producers have been besieged by demand all year. Though the Harvey fast tax write-off may mean that Washington has finally decided to loosen up on amortization O. K.'s for aluminum, no immediate relief is in sight.

Mr. Harvey says his company hopes to be in production by late 1957 or early 1958. The plant at The Dalles, Oreg., will have a capacity of 54,000 tons, and, under terms of the government contract, two-thirds of its output will be available to nonintegrated fabricators—"on a national basis."

Prospects — Five other new plants are waiting government approval, three proposed by new producers (see table). Those of Reynolds, Kaiser, Olin-Mathieson and the St. Joseph Lead-Pittsburgh Consolidation combine are to be located around the Ohio river valley. They'll burn coal, and their combined capacity adds up to 321,000 tons a year.

Fast tax amortization inducements are perhaps most vital to the St. Joseph combine, which has no fabricating facilities. There's little profit to be made in selling ingot. But none of the companies will jump before the government makes up its mind. Given a speedy decision, it's possible the industry can add some 500,000 tons of capacity by the end of 1960. Without it, a significant increase could well be postponed a year or two.

Plugging the Gap—Meanwhile, existing producers are adding to plant in attempts to catch up with demand. Anaconda Co., new to the business this July, will contribute about 25,000 tons to 1955 output. Capacity of the plant will be 65,000 tons a year. This contribution will have little over-all effect until 1956, since Alcoa is phasing out equivalent high-cost capacity at Massena, N. Y.

Alcoa's expansion program should be completed by the second quarter of next year. It includes 20,000 tons at Point Comfort, Tex.; 45,000 tons at Rockdale, Tex.; and 10,000 tons at Wenatchee, Wash. Long-term, Alcoa is looking for a new smelter site and also expects an additional 75,000 tons at the Massena plant when power from the St. Lawrence project comes in late 1958.

Reynolds is adding 25,000 tons at its Lister-Hill, Ala., plant and 10,000 tons at its Corpus Christi, Tex., plant. Both of these additions will be completed next year. Aluminium Ltd. of Canada, which will ship some 225,000 tons of aluminum pig to the U. S. this year, expects to up its contribution to 320,000 tons by 1958. Capacity at Kitimat alone will be expanded to 330,000 tons by 1959.

Outlook — Next year, almost 200,000 tons of extra primary aluminum will come on the American market as a result of these additions. Few industrymen think it will be enough, especially if full stockpiling is reinstated. Even by 1958—when Harvey's 54,000 tons will come in, when Alcan will ship 320,000 tons and when Alcoa's Massena production will revive—the situation won't ease much.

New plants and new producers will be needed to provide a cushion. They should be a factor by 1960. From then on, prospects are for a steady growth at a rate of at least 100,000 tons a year.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department,* STEEL, *Penton Bldg., Cleveland 13, O.*

New Plant and Equipment Spending Flows

(annual rate: billions of dollars)

	1955					1954
	Jan.-Mar.	Apr.-June	July-Sept.	Oct.-Dec.	Annual	Annual
All industries	$25.65	$27.19	$29.03	$29.73	$27.90	$26.83
Manufacturing	10.17	10.84	11.36	12.05	11.19	11.04
Durable	4.78	5.06	5.48	5.96	5.36	5.09
Nondurable	5.39	5.78	5.88	6.09	5.83	5.95
Mining	0.80	0.94	0.93	0.92	0.90	0.98
Railroads	0.74	0.80	0.98	1.12	0.91	0.85
Transportation, other than rail	1.46	1.62	1.68	1.47	1.56	1.51
Public Utilities	4.01	4.09	4.64	4.68	4.45	4.22
Commercial and other	8.46	8.90	9.43	9.48	8.89	8.23

Sources: Securities & Exchange Commission and Commerce department

Capital Outlays To Increase 4% Over '54

LAST DECEMBER businessmen were predicting to the Department of Commerce and Securities & Exchange Commission that outlays for new plant and equipment in 1955 would not reach the '54 total of $26.83 billion.

The same men are estimating that spending in the last quarter of this year will reach an annual rate of $29.73 billion, and that when the "dust has cleared," some $27.90 billion will have been spent in 1955 for new plant and equipment. Estimated expenditures for this year will be 4 per cent over 1954 and within 1 per cent of record spending in 1953 ($28.3 billion).

Gains Skyrocket — About half the $4.08 billion increase (scheduled anual rate) from the first to the fourth quarter of this year (see table) is accounted for by manufacturing concerns, particularly in durable goods industries. Manufacturing firms are planning to spend $11.19 billion for plant and equipment this year. This is slightly more than last year's total ($11.04 billion) and 6 per cent below the peak year of 1953.

Based on the annual estimate for 1955, primary iron and steel will spend 15 per cent more than last year. Primary nonferrous metals will dip below the 1954 total of $246 million by 9 per cent. This is caused by a slow start—only $86 million was spent during the first half of this year. Estimates for the second half show that some $139 million will go into expansion of primary facilities.

Electrical machinery and equipment makers will increase spending from $439 million in 1954 to an estimated $449 million this year. Nonelectrical machinery producers will increase outlays by some 14 per cent over last year's total of $694 million.

Surprise—Railroads are making the most substantial revision in plans. Owing to increased profits and the decision to take steps toward modernization, carriers have raised expenditure estimates 20 per cent since February.

Nonmanufacturing — Gas companies are expecting record outlays (28 per cent above 1954), and wholesale and retail trade concerns are planning almost 15 per cent higher outlays than last year.

Among nondurable goods groups, food, textile, paper and rubber companies are planning increases over first quarter estimates. The chemical industry shows a downward trend of 7 per cent, and petroleum has reduced its plans slightly but still will spend a near-record total of $2.7 billion.

Point of interest: In most cases, businessmen are planning for expansion without knowing what kind of tax incentives the government will provide. While rapid tax amortization would be welcome, few are waiting for it.

Navy Awards Hit $75 Million

Naval contracts worth $75 million went to small business firms in fiscal 1955. This was 73.8 per cent of procurements that were within the scope of small business production. Total grants: $3.9 billion.

Over the last six years, small business got $6.7 billion (20.4 per cent) of $33 billion spent on Navy contracts.

More Steel Capacity

Jones & Laughlin Steel Corp. discusses its second expansion program of '55

FINAL DECISION has not been reached, but it appears that J&L will expand capacity at its Otis Works by about 30 per cent. Present capacity of the Cleveland facility is 1.3 million ingot tons annually.

Definite cost figures on the new expansion program have not been released, but J&L already has a $50-million program under way at its Aliquippa (Pa.) Works (present capacity, 1.8 million tons) and Pittsburgh Works (present capacity, 3.1 million tons). This program includes such items as an electric-weld pipe mill at Aliquippa to produce for the oil industry; improved and expanded wire and wire specialty manufacturing facilities; and a continuous galvanizing line at its Pittsburgh Works.

What Kind?—J&L officials say that no decision has been reached as to what form the new expansion, if approved, will take. However, it is logical to assume that new sheet facilities will be scheduled for the Otis Works, which is in a position to serve the automotive industry.

During the year at J&L, an expansion program of some $135 million has been discussed, and it may be that a facilities increase of this proportion will be triggered soon.

J&L's discussions closely follow Republic Steel Corp.'s announcement that it will increase its steel ingot capacity by 1.6 million tons. Point of interest: STEEL's prediction on Sept. 5—that most of the steel expansion would come in an area bounded on the north by the Great Lakes, on the east by Pennsylvania, on the south by the Ohio river and on the west by the Mississippi—is already coming true.

Detroit Steel Corp. Replies

There is little doubt that Detroit Steel Corp. will round out its facilities to make full use of its steel ingot capacity in the next two years. "But," company spokesmen told STEEL: "We haven't even come up with an expansion program."

Rumors and some published reports have indicated that Detroit Steel already has decided to spend some $15 million on expansion during the next two years. Company officials explain: "This figure came from an offhand, 'blue-sky' estimate at our recent stockholders meeting." The firm is actively engaged in refinancing and will not undertake an expansion program until the details of the financial program are complete.

Pipe Facilities To Increase

U. S. Steel Corp. is installing a second new coiler at its Youngstown District Works. L. D. Woodworth, general superintendent of the district, says that the strip mill will be down for over two weeks. The 40-in. slabbing mill which supplies the strip mill will be down, too.

Mr. Woodworth explains that the new coiler will make it possible to coil the output of the strip mill and that the unit will produce tighter, heavier coils with "less edge damage."

New Coiler on the Way

A. O. Smith Corp. plans to produce 30-in. pipe in its Milwaukee pipe mill by February or March of 1956. Its present range: From 8⅝ to 26 in.

New Surface Condenser

Made by Allis-Chalmers for Wisconsin Electric Co., this 105,000-sq-ft unit uses aluminum heat exchanger tubes

New facilities are being added to reduce shipping costs. A. O. Smith Corp. of Texas has made all the larger pipe for the parent corporation. The Houston firm is jointly owned with Armco Steel Corp. Houston facilities now will produce smaller sizes, too. Most of the 30-in. pipe production from the Milwaukee mill probably will be used for the northern section of a 1200-mile natural gas line to be constructed between Louisiana and Michigan by the American Louisiana Pipe Line Co.

Another Steel Firm?

The fourth new steel company proposed in three years turns up in California

"IS YOU IS, or is you ain't?"

That's what steelmen in the San Francisco bay area were asking each other last week. Reason: A fourth proposed steel company has popped up.

A Start—So far, those which have come to the plate haven't connected, but Lake Iron Ore Co., seems to have at least gotten a "piece" of the ball.

This company announced in Redding, Calif., that it has purchased 1240 acres and has optioned 2000 acres on the southeast side of Shasta lake (Calif.) for contemplated steel mill operations.

Same Player—G. I. Dumond is a partner in Lake Iron Ore. He also is involved with Mt. Shasta Steel & Tube Co., which last year reported it had taken a swing at plans for a steel mill and smelting plant in Shasta county. The Mt. Shasta company is supposed to have amended incorporation papers in Carson City, Nev., this summer for stock selling purposes.

Mr. Dumond now dreams of bringing iron ore across Shasta lake by barge. Before he signed with Lake Iron Ore, Mr. Dumond was the guiding hand behind Yolo Steel & Metal Co., Sacramento, Calif., which in three years "built" a $136-million plant—on paper.

Mystery—To make the situation more puzzling are the still to be confirmed plans of Western Empire Steel Corp., which last Apr. 26 filed a certificate of necessity for a $131-million steel plant at Oakley, Calif.

Big Boom in Rails

Pennsylvania's President Symes sees sharp upturn in rail hauling by 1965

RAILROADS must spend at least $20 billion for capital improvements in the next ten years to met peacetime transportation needs.

This estimate by James M. Symes, president, Pennsylvania Railroad, is double the amount spent in the last decade. It is based on estimates that rail hauling in 1965 will be over 850 billion ton-miles.

Anticipation—Railroads will be hauling 55 per cent of the nation's traveling goods by 1965, Mr. Symes claims. This would be a sharp reversal of the downward trend rail transportation has suffered in the last ten years.

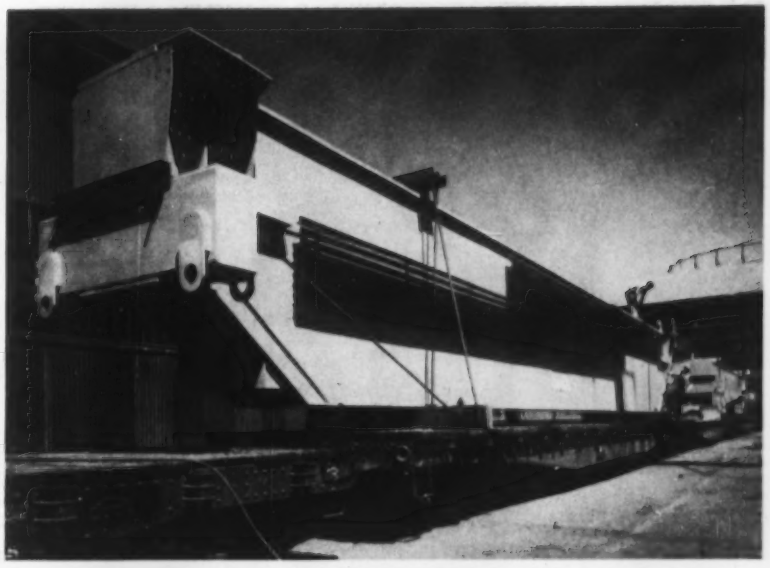
Reason for Losses — The increased cost of equipment, which cannot be met by higher fares, has led to today's passenger service deficits. Mr. Symes recalls that 30 years ago a ten-car train seating 800 passengers cost about $350,000. Today, the locomotive alone is about $300,000.

Solutions — The Pennsylvania Railroad's president thinks that passenger hauls of less than 1000 miles probably will boost revenues. The short hauls do not compete with airlines which have a favorable time factor in long distance service.

The Aerotrain, a lightweight passenger train developed by General Motors Corp., also will help. Its lower capital investment per seat, plus lower maintenance costs, will enable railroads to operate at fares which will produce a profit.

Although the Aerotrain is not on sale yet, GM will give the railroads a chance to test-run it on regular schedules. The Pennsylvania plans to put the Aerotrain on its Pittsburgh-New York run before Christmas.

Piggyback — This service has proved profitable in the freight line without hurting regular business. Mr. Symes claims that company revenues from this service soon will gross $8 million a year. He added that about 60 per cent of the trucks carried have been owned by common carriers.



Columbia River's Dalles Dam Gets New Crane

Built by Moffett Engineering Co., Albany, Calif., this crane (capacity, 370 tons) is the first of two believed to be the largest power house rigs ever built on the Pacific Coast. Each of its two trolleys has a 185-ton main hoist and a 30-ton auxiliary hoist. Lifting beams provide the means for hoisting heavier loads on a single hook. A special hydraulic buffer halts overtravel

Power for 1980

The atom will have to help out because other fuels can't meet tomorrow's energy needs

ATOMIC POWER plants will be the cheapest solution for a country whose power needs will rise 250 per cent in the next nine years.

Estimating 1964 power production at 1.40 trillion kw-hr, O. B. Falls Jr., marketing manager of GE's Atomic Power Equipment Department, says: "65 per cent of power generating plants added in 1980 will be atomic."

Backing Claim: The Federal Power Commission announced that electrical energy production hit an all-time record of 509.7 billion kw-hr for the year ending July 31, an 11.9 per cent increase over 1954.

July coal consumption alone hit a record 11.7 million tons, 24.5 per cent over 1954 figures.

Economy Boost: Mr. Falls adds: "If low cost energy is to determine our economic health, in the next 25 years conventional fuels must carry more load than reports indicate they can handle." Future power systems will have to be supported mainly by a limitless source of atomic energy.

Costwise, he reports: "An atomic power-generating plant of the boiling-water reactor type probably will cost between $200 and $270 per kw-hr. Conventionally fueled steam plants will be about $175 per kw-hr."

Cost Cutters: Larger reactors, reduced unit development cost, quantity production and simplified test procedures are expected to drop costs of nuclear power plants to $145-$165 per kw-hr by 1980.

Other Side Speaks—Meanwhile, Felix E. Wormser, assistant secretary for mineral resources, Department of the Interior, "doubts that the next ten years will see any substantial displacement of conventional fuels by solar or nuclear energy."

Says Mr. Wormser: "It appears that for some time the processing of uranium will consume more energy than the useful energy obtained from the metal. Synthetic oil, nuclear power and solar energy probably will all be contributing to the ever growing demand for energy, but coal, oil and gas are still likely to be the chief sources of energy in 1965."

Precision Casting Co.

Impeller housings, other new automotive uses add to aluminum boom

Aluminum Castings Head for New Highs

IT'S A BANG-UP YEAR for aluminum castings. Shipments in the first six months were almost equal to the 1948 total.

The big increase is in permanent mold and diecasting—where production has doubled in three years.

Diecasting—New uses in autos—automatic drives, rocker box covers, transmission covers, carburetors and distributors—make up a big chunk of the new business. Also important are fractional horsepower motors, gas meters, and home appliances.

Aluminum Casting Shipments

(in millions of pounds)

	Total	Sand	Perm Mold	Die
1953	654	215	200	239
1954	617	158	214	245
1955	840	170	310	360
1956	865	165	325	375
1957	970	165	375	430
1958	1065	165	420	480
1959	1230	165	500	565
1960	1360	165	560	635

1953-54 Bureau of Census
1955-1960 Estimated by STEEL

Accuracy, thin walls, good finish and added strength bring new customers to die-casting.

Machines are better. New ones take less space and produce more with fewer men. Standard machines make castings 25 per cent larger than three years ago.

Permanent Molding—Big castings, 150 to 200 lb, are made in production lots. Casting rates are slower than for diecasting, but molds cost less than dies.

Automotive pistons are a big item for permanent mold casters. Others include transmission housings, cooking utensils and bases for street lighting poles.

Sand, shell and plaster cores are often used with permanent molds. This adds flexibility to the process. Ordering quantities of 100 to 250 are practical if repeated.

Permanent molders think that their progress will match that of the diecasters. One thing may hold them back—diecasting has the glamour. More money is being spent on diecasting; more engineering interest is focused on it.

Sand Casting—It's a wartime essential. Sand castings are used for aircraft and guided missiles. In peacetime the problem is to maintain enough capacity for wartime needs. Several large casters have closed their sand foundries. But there is a hard core of jobs that can be made only in sand.

Supply and Demand—Plans for new large-scale uses of any kind of aluminum casting may be held back by the shortage of aluminum.

Aluminum diecasting production has increased 3.5 times since 1947. David Laine, executive secretary of the American Die Casting Institute, terms the supply situation "explosive." He points out that the price of secondary aluminum is higher than the price of primary.

Interference?—Don Wilmot, vice president, Aluminum Co. of America, says government stockpiling policies have caused the shortage.

E. R. Bergman, president of U. S. Reduction Co., predicts aluminum supply will be close to demand in coming years. For STEEL's roundup of aluminum expansion plans, see page 69.

Wire salesmen sleep easier as mattresses and . . .

Bedsprings Bounce Back

THE FAIR-HAIRED salesman for wire producers used to sell the corset accounts; now he's likely to be selling the bedding trade.

It takes 375,000 tons of steel annually to put America to bed in proper style. And the search for a good night's sleep is moving this total upward. Except for a slight decline in 1954, the trend to coil spring bedding has gained momentum each year since 1950. It accounts for close to 14 per cent of the dollars spent for household furniture and bedding.

Beginnings—The whole business got started back in 1860 when beds were little more than planks or a cord web on a rectangular frame. Jim Liddy of Watertown, N. Y., woke up at dawn with a backache. It was market day, and Mr. Liddy was still cussing his uncomfortable bed as he and the missus lurched to town in the family carriage. Restless, he bounced about on the spring seat. Idea!

When this clever fellow got back home that day, he built himself a crude bedspring. It wasn't long till a coiled steel bedspring was on the market.

Record—Sales this year of more than 9-million innerspring mattresses (worth about $190 million) will top the previous best year, 1953, by nearly 6 per cent. Bedsprings (7.7 million units worth $125 million) will make about the same bounce percentagewise.

The unit increase somewhat outpaces that of dollar volume, reflecting price weaknesses in most of 1954 and this year.

Keys to comfort in an innerspring mattress are the spiral coils and the way they are (or aren't) interconnected. The trend is toward more coils, and many designs require over 800 spiral springs. The coil unit is sandwiched between padding and insulating material, and each coil is enclosed in a pocket of heavy textile.

Variety — In the assembly of wire-tied innerspring mattresses, coils are larger and fastened together with small helical springs. There are many designs, and the number of coils is about 500, depending on design, assembly and size of wire.

Spiral coils for mattresses and bedsprings are formed from harddrawn, bright-finished 0.55 to 0.60 carbon wire in gages 9 to 13. Some coils are tempered steel, and manufacturers give ten-year guarantees against coil breakage in some cases.

Most of the larger companies make their own parts, but in all, about 2500 companies get into the act, most of them turning out coils, frames, helical springs and components for assembly by other fabricators.

Military Meets Industry

Defense department planning officers and industrial executives will meet in California during October. Objective: Mobilization planning.

T. P. Pike, assistant secretary for defense, said the meetings aim at getting more production know-how into industrial mobilization plans.

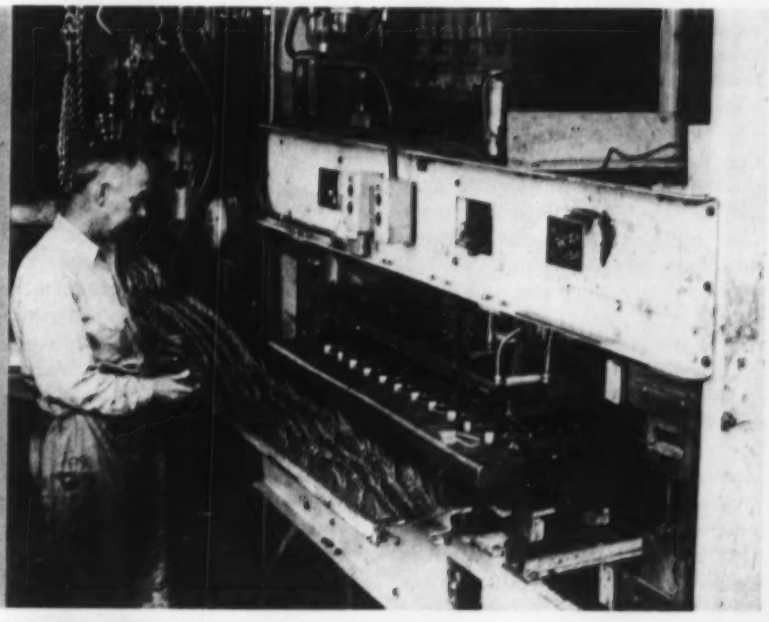
Part of a series: First meetings will be in San Francisco, Oct. 5-6; Los Angeles, Oct. 10-11.

Subjects: Stockpiling, industrial equipment layaways, preparedness measures and maintenance of the Industrial Mobilization Base, critical materials conservation and the need for accurate lead-time schedules.

Innerspring Mattresses and Bed Springs

	Units (in millions)	Dollar Value (in millions)
1955*	16.78	$316.8
1954*	15.40	290.6
1953	15.87	299.6
1952	15.93	288.7
1951	13.63	262.2

*Estimated



Coil springs are joined in rows by this machine at Sealy Mattress Co., Cleveland

By E. C. KREUTZBERG Washington Editor

Lobbying Groups Submit Expenditure Reports

	First Half 1955	1954
Transportation Association of America	$227,011	$31,275
American Tariff League	153,586	46,479
National Association of Electric Cos.	70,687	47,649
CIO	66,809	53,393
AFL	63,780	58,553
National Associated Businessmen Inc.	59,447	20,755
Association of American Railroads	51,211	124,464
Southern States Industrial Council	50,844	50,192
National Coal Association	35,163	37,570
Gypsum Association	30,850	2,608
Committee for Pipe Line Cos.	30,058	26,928

Source: *Congressional Quarterly*

Lobbying Is Inexpensive

LOBBYING EXPENDITURES for the first half of this year came to $2.2 million. Divide this among 194 registered groups which have thousands of members and you come up with this observation: The lobbying industry is "peanuts" when it's judged by its dollar cost to each person or organization represented.

Owing to proposed federal highway legislation, the Transportation Association of America spent the greatest sum during the first half of '55. TAA says this total (see table) includes the amount spent for the support of "all the organization's purposes and functions." By law, explains TAA, only 1 per cent of the total had to be reported.

History—All groups registered under the Lobbying Act of 1946 are required to file quarterly accounts to Congress of their receipts and expenditures. Many reporting groups are criticizing the law, stating that clarification is needed and that uncertainty exists as to coverage and reporting obligations. Some groups filed in "good faith," while others submitted reports under "protest."

Twenty-six organizations spent over $30,000 during the first half of this year. Labor continues to furnish two of the leading groups. The AFL and CIO also are cropping up on most lists which reflect any kind of political spending—notably on reports listing contributors to campaign chests of congressmen.

Licensing Runs Aground?

American manufacturers, reports Stephen P. Ladas, international law specialist, are faced with three legal uncertainties when exporting company trademarks or know-how under licensing agreements.

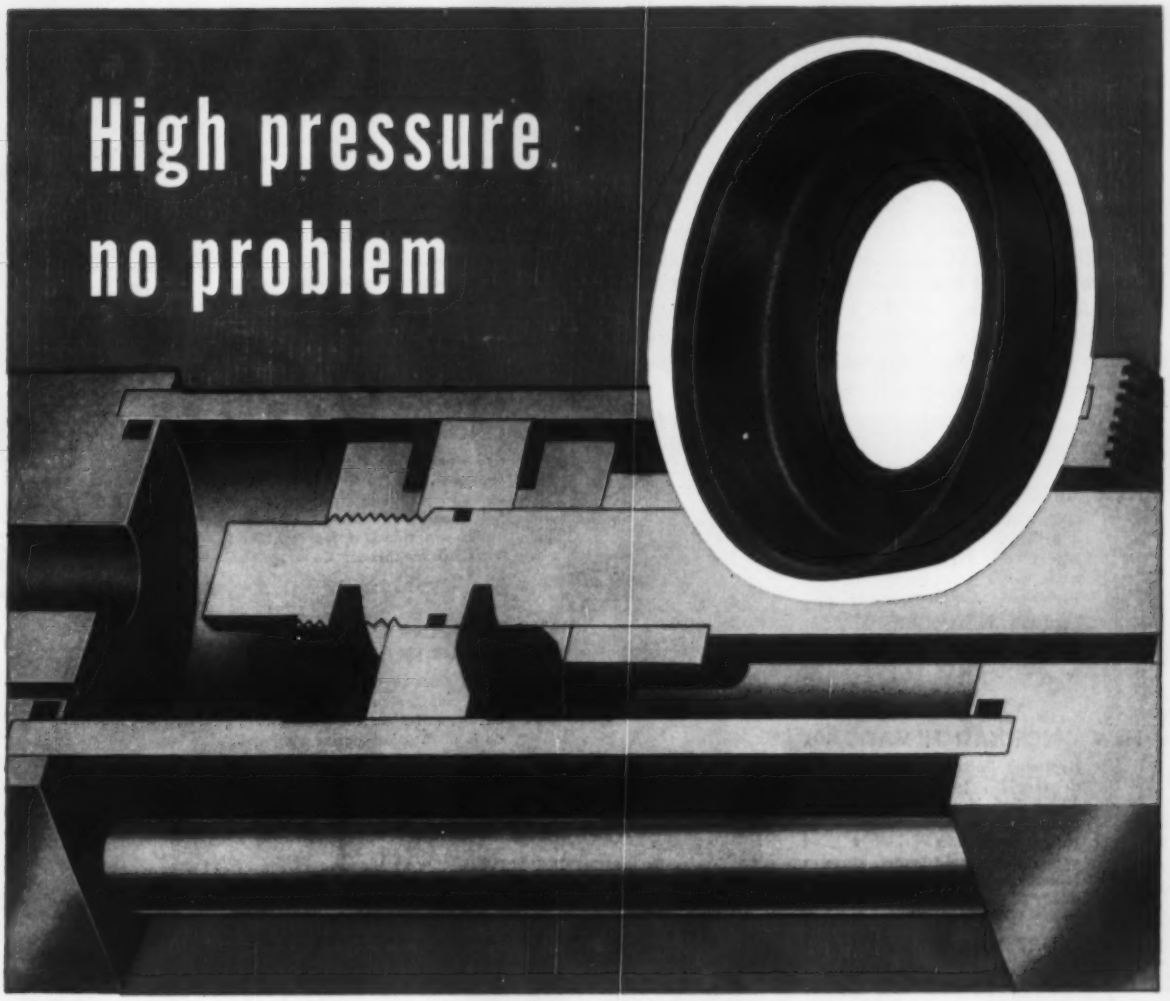
Appearing before Sen. Harley M. Kilgore's Antitrust & Monopoly subcommittee, Mr. Ladas requested clarification on the following points: 1. Companies are not sure if it is legal for them to stop selling their products in the licensee's country and to have the licensee cease exporting products to the U. S. 2. American firms are in the dark as to the lawfulness of requiring the foreign licensee to use the trademark of the U. S. firm—and no other. 3. There is confusion in regard to entering into an agreement which applies to a group of countries as well as a single nation.

Offshore Oil Costs Rise

Douglas McKay, interior secretary, points out that the cost of drilling for offshore oil is increasing. Reason: Complex problems are being encountered which could not be foreseen. The investment by the oil industry to date, for the privilege of drilling in less than 5 per cent of the total Louisiana and Texas offshore areas, amounts to $250 million.

Here and There

The Defense department still is concerned with "allowable costs." The big question revolves around how to handle incentive payments, profit - sharing agreements and bonuses as elements of cost when more than 25 per cent of a company's business is with DOD. Box score: Air Force officials oppose allowing these costs; the Navy will permit them if the claims are reasonable . . . A three-day symposium on military packaging and materials handling is being sponsored by the Pentagon and Commerce department. To be held in Washington (Oct. 10-12), the meeting will feature speakers from industry and government . . . Basic research has been launched by the Bureau of Mines to determine if rare earths can be used in the manufacture of steel —both as alloying constituents and as substitutes for manganese . . . The National Automobile Dealers Association is inviting all automotive and allied groups to an October meeting in Washington. Reason: NADA hopes that a single highway financing plan can be drafted by the group, so that a unified recommendation can be presented to the coming session of Congress.



SIRVIS-CONPOR PACKS IN A BIG PUSH

Got a high pressure problem? Maybe we can help. Chicago Rawhide's Conpor impregnated Sirvis leather packings are doing an outstanding job at pressures up to 10,000 psi. They are insoluble in most hydraulic fluids and are compatible with a wide range of other oils, solvents and gases. Sirvis-Conpor packings do not score cylinders, do not "chatter." The impregnations have no true melting point and will operate from as high as 225° down to –65° F. Sirvis-Conpor packings have high tensile strength, excellent resiliency, and operate without undesirable leakage. No other sealing material combines these advantages with long service life at such low cost. Let C/R engineers show you how to solve your hydraulic and pneumatic sealing problems with Sirvis-Conpor packings.

Send for "Report on Conpor." Write A. S. Berens, Chicago Rawhide Mfg. Co., 900 N. State St., Elgin, Ill.

C/R conpor
CONTROLLED POROSITY
SIRVIS MECHANICAL LEATHER

CHICAGO RAWHIDE MANUFACTURING COMPANY

1301 Elston Avenue SIRVIS DIVISION **Chicago 22, Illinois**

Other **C/R** *products*

OIL SEALS: Shaft and end face seals for all types of lubricant retention and dirt exclusion • SYNTHETIC RUBBER: (Synthetic rubber) diaphragms, boots, gaskets, and similar parts for critical operating conditions • SIRVIS: Mechanical leather packings and related products.

. . . and did you see

CINCINNATI

Most metalworking men are still talking about the recent Machine Tool Show; the new equipment; new methods; cost-reducing potentials. Perhaps you did not see all that you wanted to, or perhaps you were one of the thousands who stayed on the job. At any rate, 13 of Cincinnati Milling's 43-machine exhibit are presented here to remind you of the fine new machine tools we have designed for your production requirements.

NEW CINCINNATI FILMATIC

Plain Hydraulic Grinding Machines; 6"R, 10"L, 10"R and 14"L sizes; 6"R x 30" size illustrated. Automatic wheel balancing is standard equipment. Automatic sizing and other production features available. Catalog No. G-660 for the 6"R and 10"L machines; catalog No. G-661 for the 10"R and 14"L machines.

NEW CINCINNATI FILMATIC

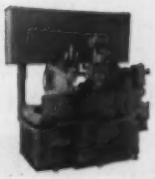
Hydraulic Universal Grinding Machines; 12", 14" and 18" sizes; 12" x 36" illustrated. New sizing and pickfeed mechanism; wider range of internal grinding head accessories; rapid cross traverse feature available. Catalog No. G-663.

NEW CINCINNATI FILMATIC

No. 3 Centerless Grinder, one of a family of six sizes. New features include anti-friction lower slide; infinitely variable regulating wheel drive; profile grinding wheel truing. Catalog No. G-664.

NEW CINCINNATI FILMATIC

Micro-Centric Grinding Machines; Nos. 1 and 2 sizes. New magnetic drive plate reduces loading time; new cabinet on machine contains all electrical controls for every variation in equipment. Catalog No. G-662.



NEW CINCINNATI FILMATIC

Semi-Automatic Angular Wheel Slide Grinding Machines; 6"R, 10"L, 10"R and 14"L sizes. 30° or 45° wheel feed. For simultaneously grinding diameters and adjacent shoulders. Catalog No. G-647.

NEW CINCINNATI FILMATIC

No. 2 Cutter and Tool Grinder is now equipped with lifetime spindle unit incorporating FILMATIC bearings. Main drive motor built into wheelhead; takes up less floor space. Catalog No. M-1914.

NEW CINCINNATI ML AND MI

Milling Machines. No. 2ML, Plain and Universal styles. No. 2MI, Plain, Universal and Vertical styles. All have independent feed drive motor. Automatic table cycles available for Plain and Vertical styles. Catalog No. M-1916.

NEW CINCINNATI DIAL TYPE

Milling Machines. Nos. 2, 3 and 4 sizes; Plain, Universal and Vertical styles. 24 spindle speeds; 32 feeds, ⅜"-90"/min. Push-button start-stop and speed selection. Automatic table cycles available for Plain and Vertical styles. Catalog No. M-1915.

NEW CINCINNATI HIGH POWER

and Dual Power Dial Type Milling Machines. Nos. 3, 4, 5 and 6 sizes; up to 50hp spindle drive; 5hp motor for feed drive. Automatic table cycles are standard for Plain and Vertical machines. Catalog No. M-1917.

NEW CINCINNATI HyPOWERMATIC

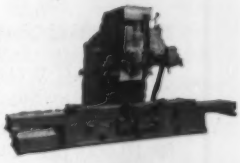
Tracer Controlled Milling Machines. Plain and Duplex styles; 42 sizes of each from 36" to 168" table travel; up to 50hp spindle drive. Automatic spindle stop; built-in anti-backlash unit. Catalog No. M-1909.

NEW CINCINNATI CONTOURMASTER

Milling Machines. For die sinking and light toolroom work. Have sensitive, manual table control and automatic hydraulic control of vertical spindle head. 16" or 22" table travel; 1hp spindle drive. Catalog No. M-1919.

NEW CINCINNATI 30"

Vertical Hydro-Tel Milling Machine. For shops requiring large, rangy vertical millers having 20hp spindle drive. Can be equipped for die sinking and/or automatic profile milling. More information available.



NEW CINCINNATI 12" HYDROFORM

Machines are compact and easy to service. Like the other four sizes available, they form intricate shapes with only half the tooling ordinarily required. Catalog No. M-1759-3.

Would you like to have more information? Write for catalogs on the machines in which you are interested.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

CINCINNATI

S. D. Strauss: Editor Turned Salesman

WILLINGNESS to speak out in an industry noted for playing it "close to the vest" has made Simon D. Strauss an outstanding spokesman for the nonferrous industry.

"Probably some of my associates think I talk too much," says the young vice president of sales for American Smelting & Refining Co., New York.

Communications — He believes businessmen should be informed, which means they should be willing to exchange ideas with others. "In selling," he points out, "the things that count are the broad outlook and keeping track of trends, not only in this country but around the entire world. This is particularly true of selling copper—the past several years have proved this.

"The salesman has to be informed to give the customer the background on availability, labor conditions and many other things which act as a guide to purchasing."

Comes Naturally—If you attend many nonferrous industry meetings, chances are you'll see Mr. Strauss on the speaker's platform, practicing what he preaches. "Maybe it's easier for me to put my thoughts into words than it is for some others because of my journalistic background," he explains.

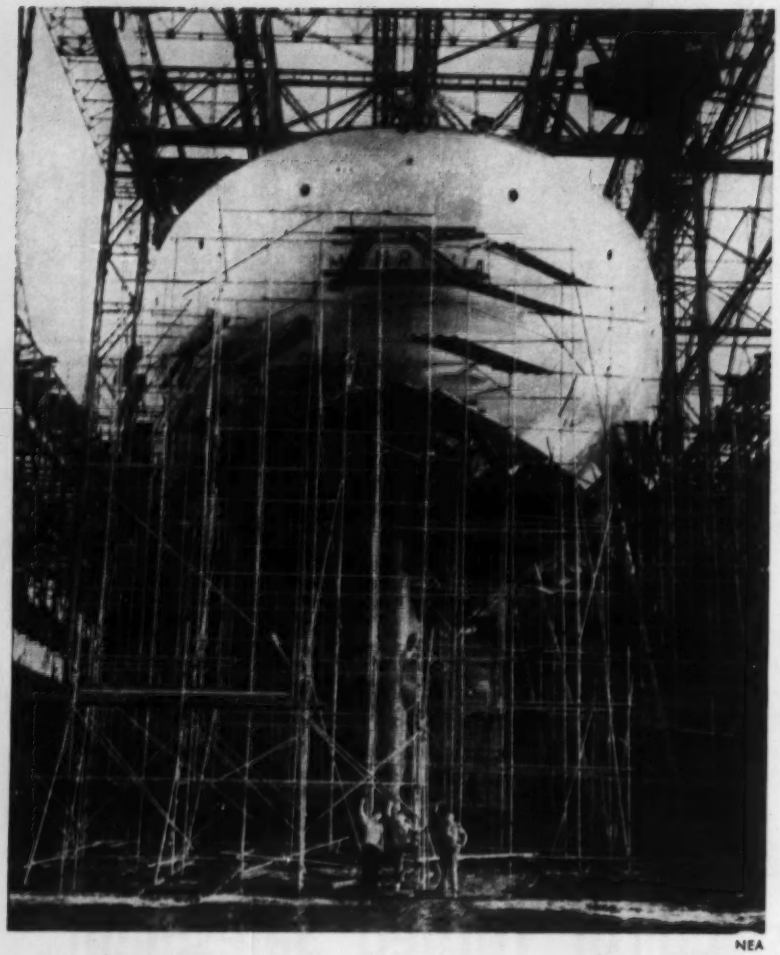
He started his business career as a reporter for the *Engineering & Mining Journal*, covering the metals markets. During this period, he became acquainted with many of the men who sit in his audiences. "In fact," he says, "that's how I met my present boss."

His journalistic background was further strengthened when he turned to editing the Madison, N. J., *Eagle*, a weekly newspaper. He later did a stint with Standard & Poor's Corp. as an analyst of mining and construction securities.

This was followed by several years in Washington, where he became vice president of the Office of Metals Reserve, Reconstruction Finance Corp.

With this broad knowledge of the nonferrous industry and the tradition of a free press behind him, the stage was set for his appointment to the general sales staff of AS&R in 1947.

Fast Rise—At the age of 44 Mr. Strauss' associates have seen fit to elect him vice president of sales and to the board of directors.



NEA

Here's part of $70 million in orders placed in German yards by shipowner Onassis

Ship Revival Boosts Hamburg

ON THE CONCRETE ways of the big Stulcken shipyard in Hamburg, Germany, a half dozen cargo vessels and tankers are in various stages of construction. In the river in front of the ways, several more are being fitted with engines and other gear.

Innovations — In streamlining ship production, Stulcken has done away with the old-fashioned mold loft with its full-size drawings and patterns. Parts are drawn to one-tenth of their size on transparent paper. Photos of the drawings are made on glass plates. In the fabricating shop, drawings are projected optically to full size, directly on the steel plates for marking.

Stulcken also has the contract for a shipyard for Pakistan to build ships up to 12,000 tons—it underbid U. S., British and French firms. The first of three sections will be completed this year.

Renaissance — Stulcken, along with other shipyards and the Hamburg port facilities, were bombed out. When hostilities ceased, the harbor was blocked with debris and sunken ships. Only 10 per cent of the wharf buildings, 28 per cent of the warehouse space, 20 per cent of the cranes and 32 per cent of the rail network remained.

Germany's prewar merchant fleet of 4.5 million tons—fifth in the world—was reduced by war losses and confiscation to 120,000 tons. After the war, German yards were under severe restrictions on size and speed of vessels they could build until April, 1951. Now tankers up to 47,500 tons are being built.

Coming Back—Construction of new craft, purchase of foreign vessels and salvaging of damaged ships have brought the fleet back to 2.7 million tons and the end is not in sight. The Blohm & Voss yard is being reconstructed and will be in operation by 1957. Other big yards are Deutsche Werft and Howaldts Werke.

The four yards account for about 80 per cent of Hamburg's shipbuilding capacity. Sixty smaller yards build harbor vessels, barges and yachts. One supplier, Pleuger & Co., has developed an active rudder in which the U. S. Navy is interested. It's an electric-motor-driven propeller housed in the main ship rudder permitting a vessel to turn in its own length unassisted. Great Lakes ore vessel owners are considering the device. Pleuger's American affiliate is the Wet Motor Corp. of Lancaster, Pa.

No. 2 — Germany is building about 1 million tons of shipping a year, of which one-third comes from Hamburg yards. Britain still leads in shipbuilding, with the U. S. in third place.

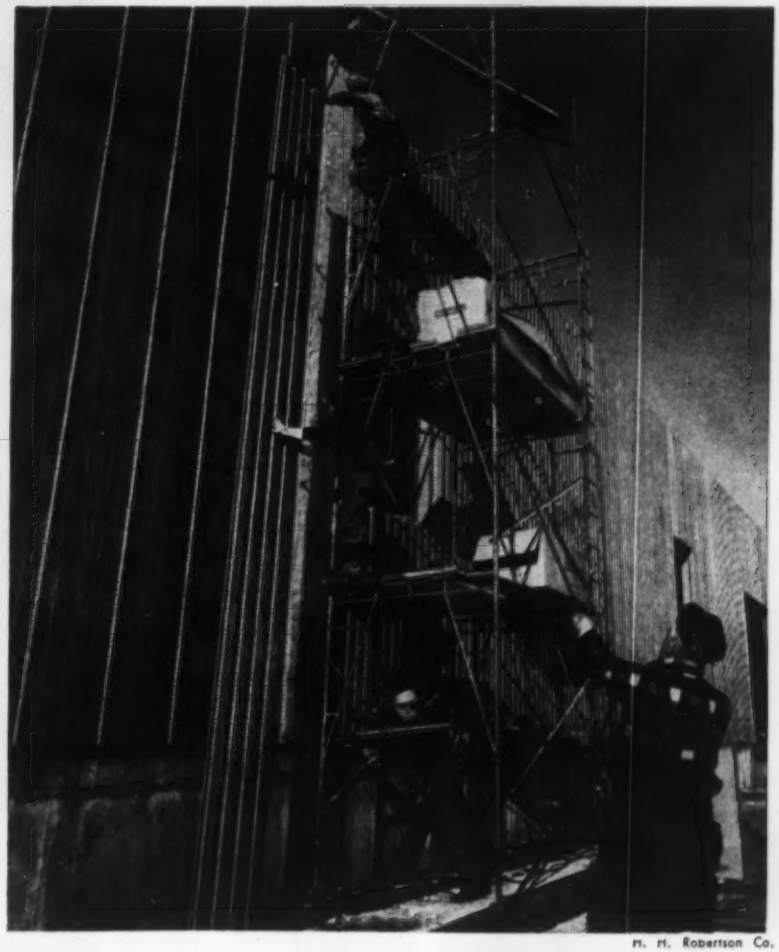
German shipbuilders use about 50,000 tons of steel a month, of which some comes from the U. S. New plate mills in the Ruhr and at Salzgitter are supplying steel. Shipyard workers get about 44 cents an hour.

Big Port—Even though Hamburg is cut off from its normal trading area to the East, the port will handle 22 to 22.5 million tons of shipping this year, compared with 20.7 million tons in 1954 and 22.1 million in 1936.

The biggest city in West Germany, Hamburg's population is up to 1.76 million and growing at the rate of 2000 a month.

Report on Europe

Back from a six-week tour of West Europe, STEEL's editor, Irwin H. Such, reports his findings in this article, the fourth of a series.



H. H. Robertson Co.

Construction spreads network across country as . . .

Scaffolding Sales Soar

METAL SCAFFOLDING dominates at least 25 per cent of the market, and sales are still climbing.

Wood scaffolds still hold first place in sales, but the continuing construction boom has boosted the demand for the metal product.

Manufacturers estimate this year's dollar volume at $32 million for metal scaffolding alone. This compares with last year's estimate of $26 million. Sales and rentals of metal rigs are expected to hit between $35 and $40 million by the end of 1956.

Rentals Jump — Many contractors rent scaffolding as they need it, charging rental costs to the job. This is cheaper than buying outright and depreciating cost over many jobs. Other advantages: No storing or transportation problems during construction's off season.

Recent market surveys show 90 rentals to every 10 sales. The ratio in 1954 was 80:20, although dollar volume of sales to rentals was almost equal.

Subsidiaries—Manufacturers are setting up separate companies to handle rental distribution and sales. Another innovation: On-the-job selling to contractors and maintenance men.

Sources — Eight manufacturers make almost 80 per cent of the scaffolding used, but there are as many as 60 firms that either specialize or cover a small sales area. Construction takes about 70 per cent of their output. Industrial maintenance is the other big customer.

Basic Types—Pipe and clamp scaffolds are popular in the building trade. Assembled quickly, they are adaptable to many uses.

Sectional or panel scaffolding also is used in construction and masonry work. Metal frames or panels are tied together with bar or tubular braces to support working platforms. They can be heightened as work progresses and are probably the strongest type.

Roller rigs, much used in maintenance and repair, provide portability. These narrow scaffolds are ideal for use in hallways and rooms where they do not impede traffic.

Materials — Tubular steel and aluminum continue to be most popular for scaffolding. Many firms also are experimenting with alloys. Automatic locking devices have replaced wing and nut fasteners on most scaffold braces. Two companies have brought out a bracket lift. The man on the scaffold pumps himself up with a ratchet device attached to the scaffolding.

New Uses — Television studios are new users. Scaffolding provides portable brackets for big studio lights and background flats.

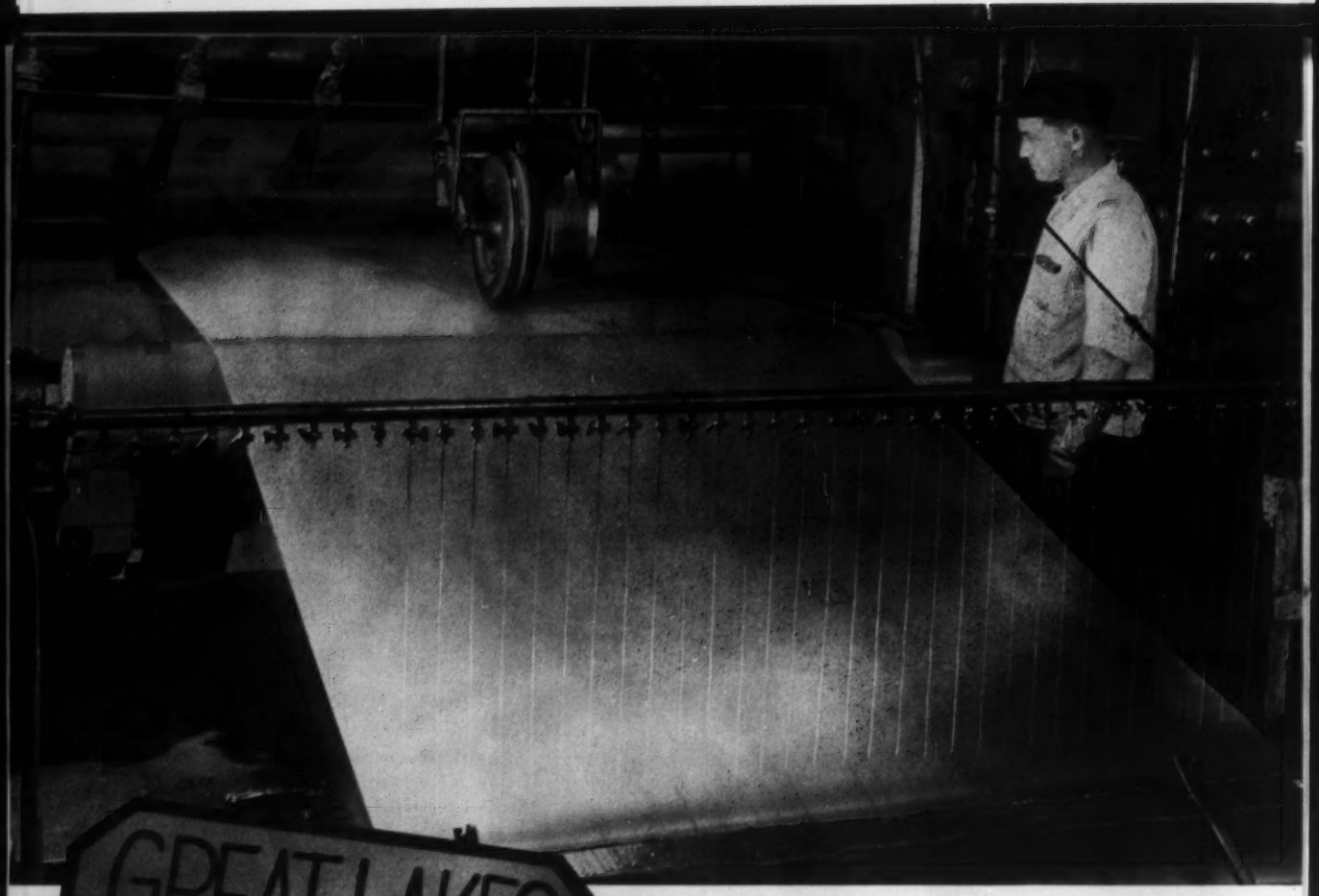
The do-it-yourself craze finds a small but ready market among home handymen who find that small scaffolds can be adapted to many odd jobs.

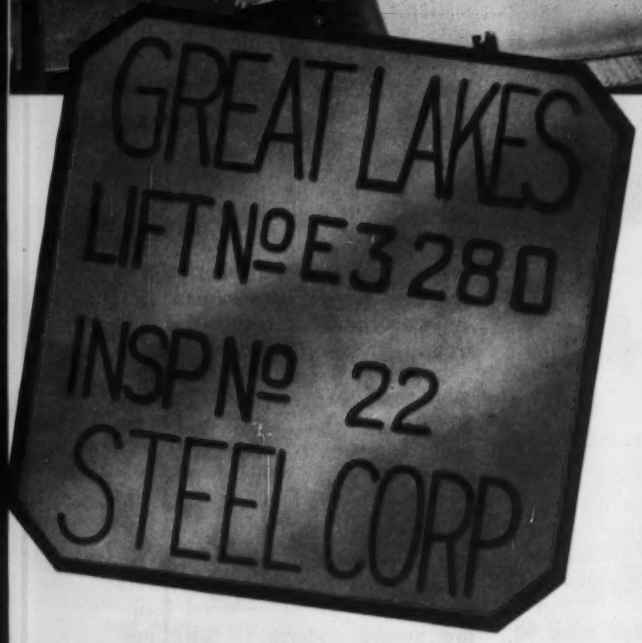
Shoring for Pouring — Gaining in popularity, this method of using scaffolding has proved to be an easy way to speed up concrete floor work. Metal or wood forms are braced underneath with portable frame scaffolding. After the floor is poured, scaffolding braces are lowered and rolled away.

Over-All Picture — More small shops are getting into the field. Their sales are beginning to have a noticeable effect on the market.

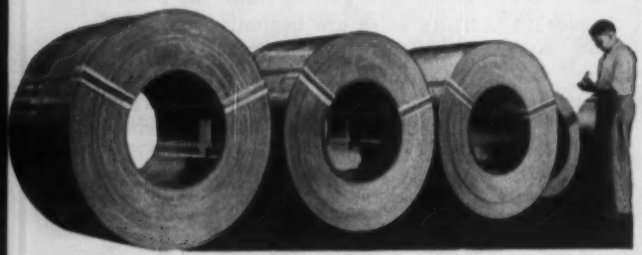
Localized price cutting has been reported in parts of the country.

Metal scaffolding sales will continue to overtake wooden scaffolding sales as industry expands.





Devices such as the one shown in operation above stamp our steel with our name. Each lift and coil Great Lakes Steel produces carries such a stamp or tag bearing an identification number from which the complete history of the material concerned can be obtained.



How Great Lakes Steel *identifies* quality

Because this identification helps us give better service to our customers, it is an important aid toward an all-important goal. The goal can be summed up: *Give each customer the quality of steel to meet his requirements—when and as wanted.*

Men throughout the mill insist on *quality with service* for our customers.

We invite you to talk over your production problems with a Great Lakes representative. His assignment is to bring into your plant the steelmaking knowledge and experience of the Great Lakes organization.

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of

NATIONAL STEEL CORPORATION

By FLOYD G. LAWRENCE *Detroit Editor*

A lower roof line on this Victoria typifies facelifting on 1956 Fords

The 1956 Auto Outlook

AUTO PRODUCTION prognosticators who underestimated 1955 output by what is shaping into a 30 per cent error are taking a crack at the 1956 effort with undaunted confidence.

Several industry leaders already are on record with a 6.5 million or better passenger car guess for 1956. But before you get your hopes too high, remember that these are the same chaps who guessed 5.8 million passenger cars for 1955.

System—It's generally accepted that the economic staffs of automakers rank among the best in the country. Consuming statistics by the basketful, they assay turnover patterns, ages of cars on the road, trends in consumer purchasing power and the pulse of the economic heart. On this basis they can closely estimate how many people should need to buy new cars in a given year and how many people should be able to buy.

But where economics falls on its statistics is in that intangible mental attitude that suddenly makes a guy notice his brakes are shot, the car is using a quart of oil every 500 miles and the wiper blades may need replacement. This is the man who two months ago had no intention of buying a car until next year but suddenly finds his dreams dominated by tail fins.

Hitch—The problem is that the purchase of a car can be deferred or moved ahead, and that's where the "Ga-Ga" factor complicates the prognostication business. Statistics may show that a certain number of people should need new cars and will have the wherewithal to buy them. But whether they will is another matter again.

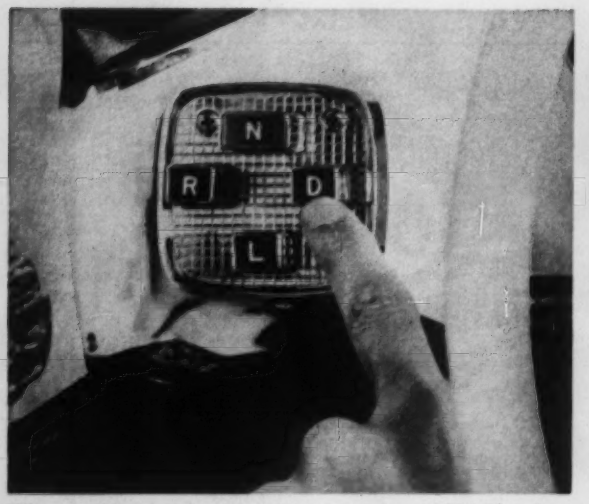
That's the oversimplified explanation of how estimates in 1955 went awry. Selling effort coupled with more than usual product sales appeal are generally credited with raising the total so far above estimates. Chrysler Corp., Ford, Mercury, Packard, Chevrolet and Pontiac helped not only themselves but also the rest of the market with their restyled products.

That's because the impact of new cars on the street and in neighbors' garages creates desire for a new car in many a mortal. But being a traditional purchaser of some other brand that is only face lifted (above 70 per cent of customers buy the same brand they trade in), he'll buy the facelift and sales will rise generally.

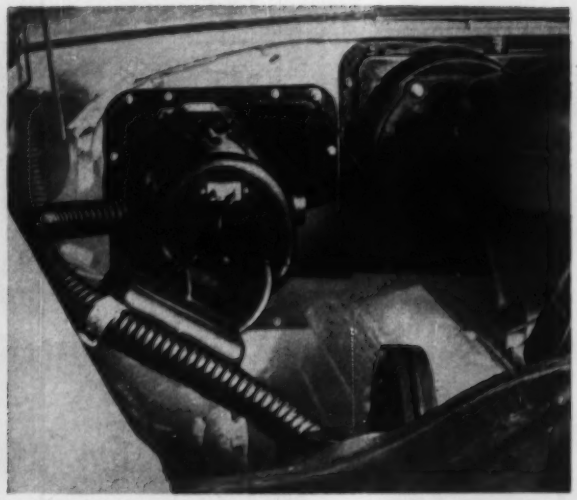
Outlook—This compounding effect (purchasing a new car because it's the thing to do) can work in reverse and might well do so in 1956. Many people who bought cars because their neighbors on both sides did probably won't have that competition to keep up with in 1956. Undoubtedly, part of the difference between the expected 5.8 million and probable 7.4 million buyers in 1955 is made up of people who intended to buy a new car in 1956 and were tempted to buy one in 1955 instead. That will remove them from the 1956 market. Not seeing so many new cars on the street takes the onus off other people to keep up, and the compounding effect begins to head the other way.

What's more, cars already shown, with the exception of the 1956 Lincoln which is importantly

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)



When equipped with automatic transmissions, 1956 Chrysler Corp. cars will have push-button controls on the instrument panel



Stewart-Warner Corp.'s instantaneous auto heater will be on two 1956 cars. It's independent of engine or coolant system

new, are merely changed versions.

The word "merely" certainly is an inaccurate expression of the automaker expenditures on their new products, regardless of how the public may react to them. Chrysler Corp., for example, spent $175 million to put its 1956 models into production, and that's only $75 million less than it spent on its all-new 1955 line. Perhaps no group of cars ever got a more noticeable facelift in their second year. The Ford Division reports changes in its product cost 11 times more than facelifts did in 1953 for 1954 products.

Psychology — While cars may more readily be recognized as "1956" than in many facelift years, there is a subtle psychological factor which makes a man say: "That cars isn't just changed . . . it's *different.*"

Even new features like pushbutton automatic transmission shifting, record players, safety door latches, new grilles and rear end treatments are likely to leave many with the feeling that these things fall into the limbo of changes rather than real differences.

It's common knowledge that none of the major volume makes will offer more than major facelifts, horsepower hikes and gadgets in 1956. Add the fact that buyers were subjected to an unusually strong brunt of new models in 1955 which tempted many to buy this year rather than wait, and estimates of industry spokesmen seem more courageous than realistic.

Like '54—It's not too hard to remember that 1954 saw only 5.5 million passenger cars turned out. This year will better that figure by almost 2 million units rather than by the 400,000 units most industry spokesmen anticipated. It's obvious that the normal turnover rate was upset by the economic climate and product appeal offered in 1955.

On the plus side for 1956 will be a strong economic climate. But even so, next year's production may be closer to the 1954 level than 1955's.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994	676,269
May	913,257	621,318
June	825,031	635,540
July	815,324	543,344
August	736,093†	523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,896,678

Week Ended	1955	1954
Aug. 20	165,094	121,736
Aug. 27	155,233	113,496
Sept. 3	105,680	110,995
Sept. 10	98,546	84,743
Sept. 17	145,437†	74,026
Sept. 24	155,000*	72,804

Source: *Ward's Automotive Reports*
†Preliminary *Estimated by STEEL

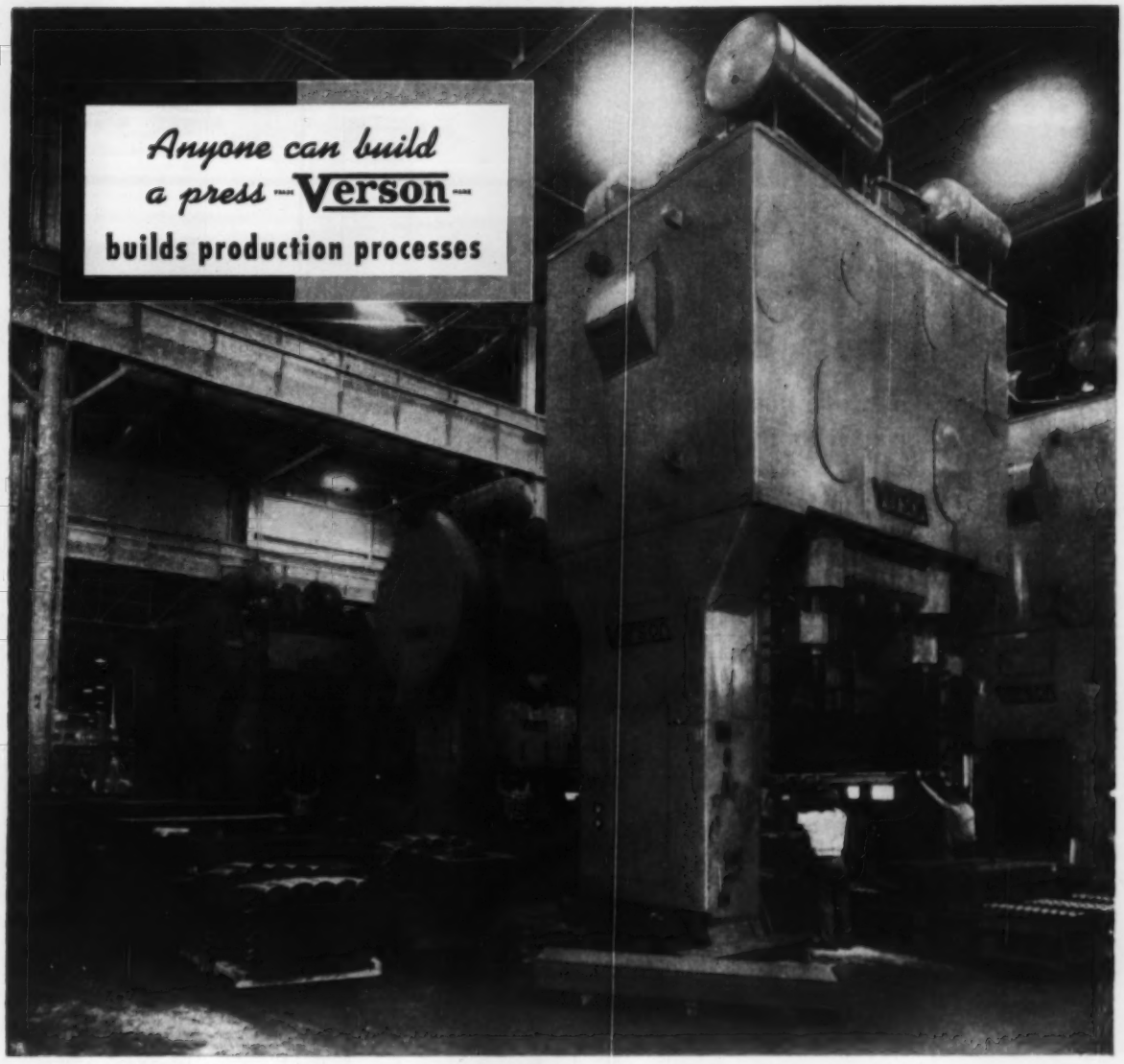
Mercury for '56

Keynoting Mercury's bid to hike its volume importantly is the new "Medalist" model. A two-door sedan priced below other Mercuries, it "offers the opportunity to step into Mercury engineering and performance at a budget-minded price." Part of the custom series, the model appears to be aimed at improving direct competition in the Buick Special area.

Mercury's low-silhouette styling extends into the Monterrey series by a new, four-door sport sedan and a two-door, hardtop coupe. The Montclair series continues both of these body styles, along with a convertible. All together, Mercury offers 13 models and is expanding facilities to produce 750,000 cars annually by 1957, compared with present capacity of about 450,000 cars.

Ford for '56

Ford, like Mercury, offers higher horsepower for 1956 and 12-volt ignition. And like Mercury, the Ford has strong points in fine handling and roadability, offers good performance in the 50-to-70-mph passing range and does 0 to 60 mph in less than 12 seconds.



2500 ton DOUBLE ACTION PRESSES... key units in this 100%

—Verson— press room

In the plant in which this photograph was made, 47 Verson presses are now in service and preparations are being made for seven more . . . a 100% Verson-equipped production process!

Building production processes is Verson's business. Anyone can build a press . . . it's what that press can be made to do as a part of an integrated process that is important. In over thirty years Verson has produced processes incorporating virtually all types of standard and special presses. All of this experience and know-how goes into every press that Verson builds.

Whatever your production problems, if they involve the press forming of metals, bring them to Verson. Here your press requirements will be treated as an integrated part of your whole production process. As a manufacturer of practically every type of press we can recommend, without prejudice, the combination of machines that will best fit your over-all requirements.

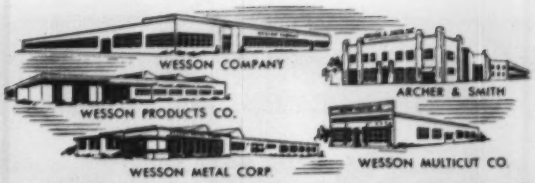
To put these facilities to work for you, just send an outline of your needs.

VERSON ALLSTEEL PRESS CO.

9318 S. Kenwood Ave., Chicago 19, Illinois • South Lamar at Ledbetter Drive, Dallas, Texas

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TOOLING • CUSHIONS • VERSON-WHEELON DIRECT ACTING HYDRAULIC PRESSES

carbide NEWS

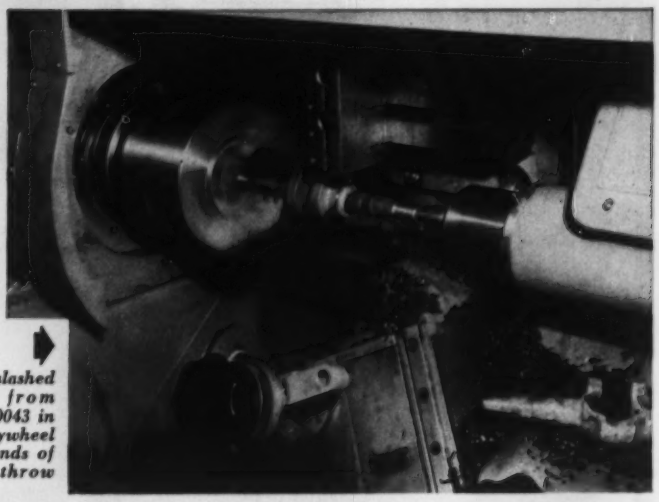


Grade 26 Cuts Tool Costs 88%

New wide range grade and holder boost pieces/grind from 85 to 800

A reduction from approximately four cents to less than ½ cent per piece in tool cost has been achieved in the machining of single-throw Arma Steel crankshafts by a midwestern machine company. These savings were obtained despite an increase in blade cost of 41% over the style previously used.

The savings were achieved in two steps. The first revealed that Wessonmetal Grade 26 would out-perform all other grades by an average of 50 pieces per cutting edge. The next step was to adopt a Wesson Multicut holder. This helped to increase tool life to 200 pieces per cutting edge. With four edges per insert, life is 800 pieces per grind, as against the original 85. Part of the overall increase is due of course to the rigid construction and support provided by the new holders.



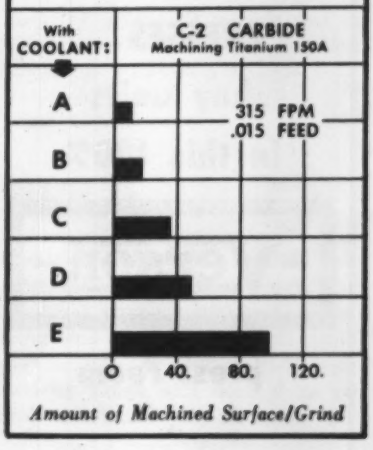
26 Carbide slashed tool cost from $0.038 to $0.0043 in machining flywheel and pulley ends of this single throw crankshaft.

Operations consist of rough and finish turning of the flywheel and pulley ends of the 220 Brinell steel crankshaft. Machining is being done dry on a 20 hp New Britain tracer lathe at 1210 rpm and .014" feed. Depth of cut averages ¼ to ⅜-inch.

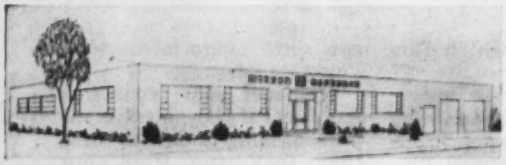
In achieving the savings, no changes were made in speeds, feeds or depths of cut.

Tool Hints . . .

The cost-cutting story told above re-emphasizes the necessity of studying ALL the factors contributing to tool performance if maximum economies are to be obtained. In this case, the answers lay in (a) the carbide metal and (b) the tool holder. Sometimes it may be the coolant which will provide a major saving. In the chart below, for instance, are shown relative lives of the same tool material at the same speeds and feeds using five different types of coolant in the machining of Titanium 150A! A C-2 grade of carbide was used and feed was .015" at 315 ft. per minute.



New Carbide Research Center



New concepts in carbide boring and milling cutter designs may result from new research programs now under way at Wesson. Included are milling cutters utilizing "throwaway" carbide blades.

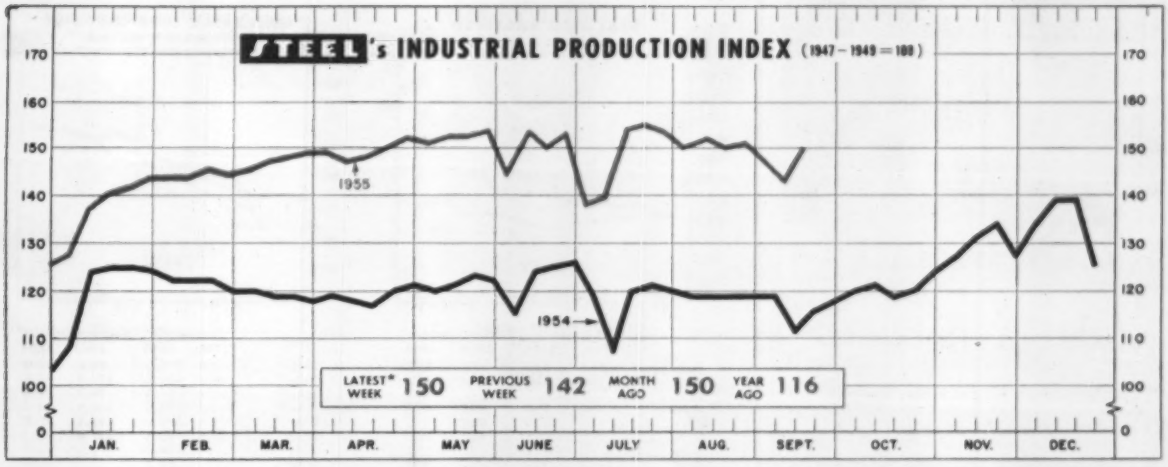
To house Wesson's expanded product development and tool application research facilities and staff, a new one-story structure has been completed adjacent to Wesson's Detroit plant.

The new research division will supplement the basic metals research carried on in Lexington, Kentucky at the new metals plant of the Wesson Metal Corporation, now producing all Wessonmetal carbides.

The new research division is under W. B. Bader, Vice President. It is being completely equipped for fabrication as well as testing of new tool designs. Lathes, milling machines, grinders, etc., are included in the equipment.

Wesson tools carbide Wessonmetal

WESSON COMPANY
DEPT. AD
1220 Woodward Heights Blvd.
Detroit 20, Michigan



*Week ended Sept. 17. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Fright Car Loadings 22%; and Auto Assemblies 11%

Metalworking Sets Peak Industrial Pace

THE NATION's production in August was a record 140 (1947-1949 = 100), measured by the Federal Reserve Board's seasonally adjusted industrial production index. (It takes into account slowdowns for vacations and other influences on business activity.)

Ups and Downs—Durable goods accounted for a good share of the rise. Topping the list of metalworking leaders were both producer and consumer hard goods. Primary metals recovered most of the July dip caused by wage disputes, mainly in copper. Reduced auto assemblies reflected the changeovers to 1956 models.

That lower output, plus continuing high sales in early September, are keeping alive auto industry hopes for a smooth dealer cleanup of 1955 models. The selling pace for the first ten days of the month climbed to 23,000 a day, compared with 22,400 in the first ten days of August, says *Ward's Automotive Reports*.

Inventory Cutting — Prospects are for about 575,000 or more deliveries this month. This contrasts sharply with production estimated at about 290,000 units, almost half of which will be 1956 models.

General Motors again reports record sales in the first ten days of a month. Both new and used cars were being moved at a new top speed by dealers. New car sales were 103,968 almost one and one-half times the figure for the same period of last year. Used car sales were up 30 per cent.

In Step—"Our sales for the first ten days of September reflect the continuing high rate of demand for General Motors passenger cars," says Harlow H. Curtice, president. "Our cars are moving into the hands of the public at a high rate and are in line with production schedules and retail sales estimates."

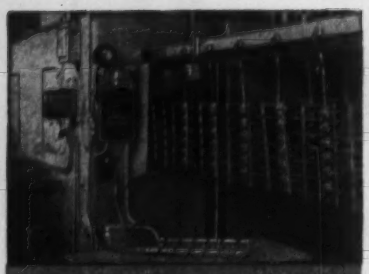
Truck sales continue to parallel record auto sales. So truck builders see no slip from the 307,600 produced in the third quarter.

Accelerating — The pickup in

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,309[1]	2,309	1,637
Electric Power Distributed (million kw-hr)	10,550[1]	10,155	8,808
Bitum. Coal Output (1000 tons)	8,575	9,645	6,751
Petroleum Production (daily avg—1000 bbl)	6,655[1]	6,662	6,178
Construction Volume (*ENR*—millions)	$381	$376	$306
Automobile, Truck Output (*Ward's*—units)	145,437[1]	98,546	74,026
TRADE			
Freight Car Loadings (1000 cars)	780[1]	707	602
Business Failures (Dun & Bradstreet, no.)	195[1]	205	168
Currency in Circulation (millions)[3]	$30,520	$30,436	$29,998
Dept. Store Sales (changes from year ago)[3]	+11%	+11%	− 5%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,528	$16,049	$18,657
Federal Gross Debt (billions)	$277.9	$277.9	$274.9
Bond Volume, NYSE (millions)	$29.4	$21.1	$14.5
Stocks Sales, NYSE (thousands of shares)	13,102	9,703	10,401
Loans and Investments (billions)[4]	$84,141	$84,412	$82,670
U. S. Govt. Obligations Held (billions)[4]	$30,791	$30,948	$35,526
PRICES			
STEEL's Finished Steel Price Index[5]	207.63	207.63	194.19
STEEL's Nonferrous Metal Price Index[6]	260.1	262.3	218.2
All Commodities[7]	111.4	111.1	109.9
Commodities Other than Farm & Foods[7]	117.9	117.8	114.5

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.



Cincinnati Owners Report

- "processes 6 tons of parts daily"
- "120% more production"
- "tremendous time and labor saver . . . time saved, 75%; labor saved, 81%"
- "cleans and finishes 1000 parts per hour in 16' x 40' floor space"

What do your part cleaning and painting operations cost?

too much? normal? don't know?

Let a Cincinnati Cleaning engineer survey your requirements, give you a no-obligation report which may point to important savings. For cleaning, or for completely integrated painting systems, you can depend on CINCINNATI.

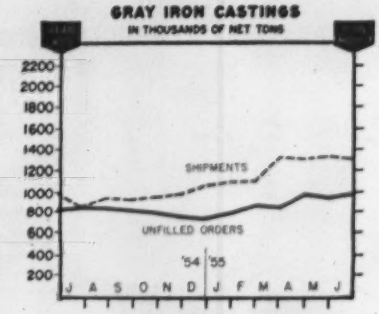
Write for FREE Information!

Cincinnati

CLEANING AND FINISHING MACHINERY COMPANY, INC.

2019 Hegeman Street, Blue Ash, Ohio

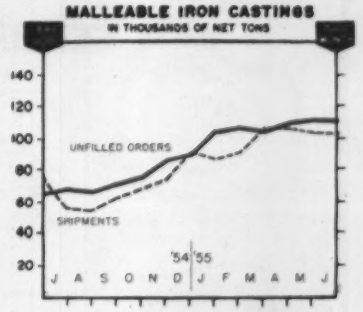
THE BUSINESS TREND



	Shipments* 1955	Shipments* 1954	Unfilled Orders* 1955	Unfilled Orders* 1954
Jan.	1,092	932	783	872
Feb.	1,106	936	852	865
Mar.	1,315	1,047	842	842
Apr.	1,294	995	966	826
May	1,310	943	938	775
June	1,296	987	982	804
July		821		829
Aug.		935		830
Sept.		921		811
Oct.		942		789
Nov.		997		760
Dec.		1,074		745
Total		11,530		

*For sale. U. S. Bureau of the Census

Charts copyrighted, 1955, STEEL



	Shipments* 1955	Shipments* 1954	Unfilled Orders* 1955	Unfilled Orders* 1954
Jan.	82.0	70.3	99.8	85.6
Feb.	86.0	69.1	101.8	81.6
Mar.	102.4	84.3	99.7	74.2
Apr.	101.2	74.5	104.1	69.1
May	98.4	67.9	106.4	67.0
June	99.5	72.8	107.6	60.2
July		50.9		63.7
Aug.		59.3		62.5
Sept.		58.0		66.7
Oct.		64.3		71.1
Nov.		70.0		80.7
Dec.		87.9		85.1
Total		829.3		

*For sale. U. S. Bureau of the Census

truck sales over 1954's has gained speed as 1955 has rolled along. At the end of May, sales of new units were 9.1 per cent ahead of those a year ago. By the end of last month, the margin had almost doubled to 17.6 per cent, says *Ward's*.

Heavy-duty trucks had another good month in August, nearly double sales in that month last year.

Building Gets Second Wind . . .

The construction boom slacked off in August, but apparently it was only catching its breath. Contract awards for heavy construction are rising again. In the latest week reported by *Engineering News-Record,* volume was $381 million.

That brought the total for the first 37 weeks of the year to a record $13.4 billion, 31 per cent above 1954 and 15 per cent higher than the previous record in 1952.

Public works awards are up sharply in the latest report. State and local awards climbed to $119.5 million. Federal awards shot up to $39.1 million, a welcome change from the low volume of the last five weeks.

Private awards were sparked by a strong surge in private mass housing. Commercial building took a sharp upturn, and industrial building rebounded from a low preceding week.

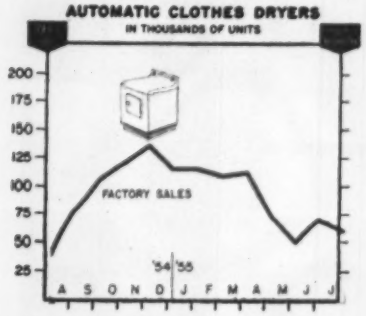
The housing boom, too, moved ahead again after slipping a little in July. Nonfarm housing starts took a 7 per cent bounce in August, says the Labor department.

August totals are best for the month since the record year of 1950. During the first eight months, almost 928,000 starts have been made, compared with just under the 800,000 during the same months last year.

Power Tools Move Ahead . . .

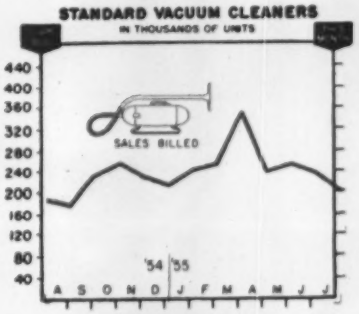
The immediate outlook for the power tool industry is brightest since early 1953, says F. P. Maxwell, vice president in charge of Rockwell Mfg. Co.'s Delta Power Tool Division.

"A noticeable upswing in orders, apparent in late spring, has gathered momentum. This decided increase has been felt in all lines —but more noticeably in our industrial and commercial tools. Each month has exceeded our estimates and budgets, causing constant upward revision of manufacturing schedules.



Factory Sales—Units	1955	1954	1953
Jan.	115,383	82,195	62,260
Feb.	109,215	62,488	57,136
Mar.	113,498	54,796	49,593
Apr.	73,978	37,661	28,556
May	49,228	26,533	32,867
June	70,616	30,297	32,789
July	60,516	40,755	33,296
Aug.	.....	80,165	70,774
Sept.	.....	107,084	86,461
Oct.	.....	122,182	81,539
Nov.	.....	138,284	75,167
Dec.	.....	115,341	82,730
Totals	.....	897,751	696,468

American Home Laundry Mfrs. Assn.



Sales Billed—Units	1955	1954	1953
Jan.	250,123	221,233	256,886
Feb.	282,651	199,035	246,007
Mar.	356,179	276,464	329,294
Apr.	244,143	220,849	265,848
May	261,238	209,434	252,104
June	241,665	195,781	197,506
July	207,788	193,607	159,446
Aug.	.....	185,397	188,838
Sept.	.....	238,235	227,253
Oct.	.....	263,197	249,383
Nov.	.....	237,883	216,227
Dec.	.....	217,022	190,773
Total	.....	2,658,136	2,781,263

Vacuum Cleaner Mfrs. Assn.

"Considering the increased flow of new orders and the still modest stocks in our dealers' hands—indicating quick turnover—we anticipate continuing increases over the balance of the year."

Material Handling Institute Inc. reports the industry's July bookings at 12 per cent above the average for 1954. Says the institute: "This is viewed as rather remarkable in light of the fact so many user companies close down for plant-wide vacations for half of July. To a large extent these bookings resulted from half a month."

TV Having Big Year . . .

Retail sales of television receivers hit a new peak in July and the first seven months of the year, reports the Radio-Electronics-Television Manufacturers Association.

July sales were at the highest level recorded for that month. For the first seven months, 13 per cent more TV sets moved through retail outlets than in the same period of last year, the previous high.

Accordingly, production has held at high levels. For the first seven months, TV output was 4,173,088 sets, 32 per cent above the comparable period of last year. Radio output of 7.8 million showed a gain of more than 46 per cent.

July production saw the usual seasonal decline bite into totals, partly because of plant-wide vacations. Fall brings an upswing.

Foundries Equip . . .

The Foundry Equipment Manufacturers Association places July orders at the highest level since August, 1953. It's the third straight month of increase.

Orders were pegged at 213.4 on the Association's index (1947-1949 = 100). The August, 1953, mark was 235.5, best of that year. The current surge in foundry equipment ordering came in March. Then, the index shot up to 163.6, more than the total of the preceding two months.

Fierce competition of today's business isn't discouraging new entries into the race. More than 10,000 new businesses have incorporated every month of 1955, according to Dun & Bradstreet Inc.

That's almost one and one-half times the pace of 1953, about one and one-fourth times last year's and 2.3 per cent over the former record pace of 1946. August incorporations were almost 11,000, a record for the month.

• Edited by GEORGE BLACK

CHEMICAL SHOW UNDERWAY

Advanced Know How will be the theme of the Cooper Alloy booth at the forthcoming Chemical Exposition in Philadelphia. Stainless steel castings, valves and fittings will be displayed along with the Vanton line of plastic and stainless steel pumps.

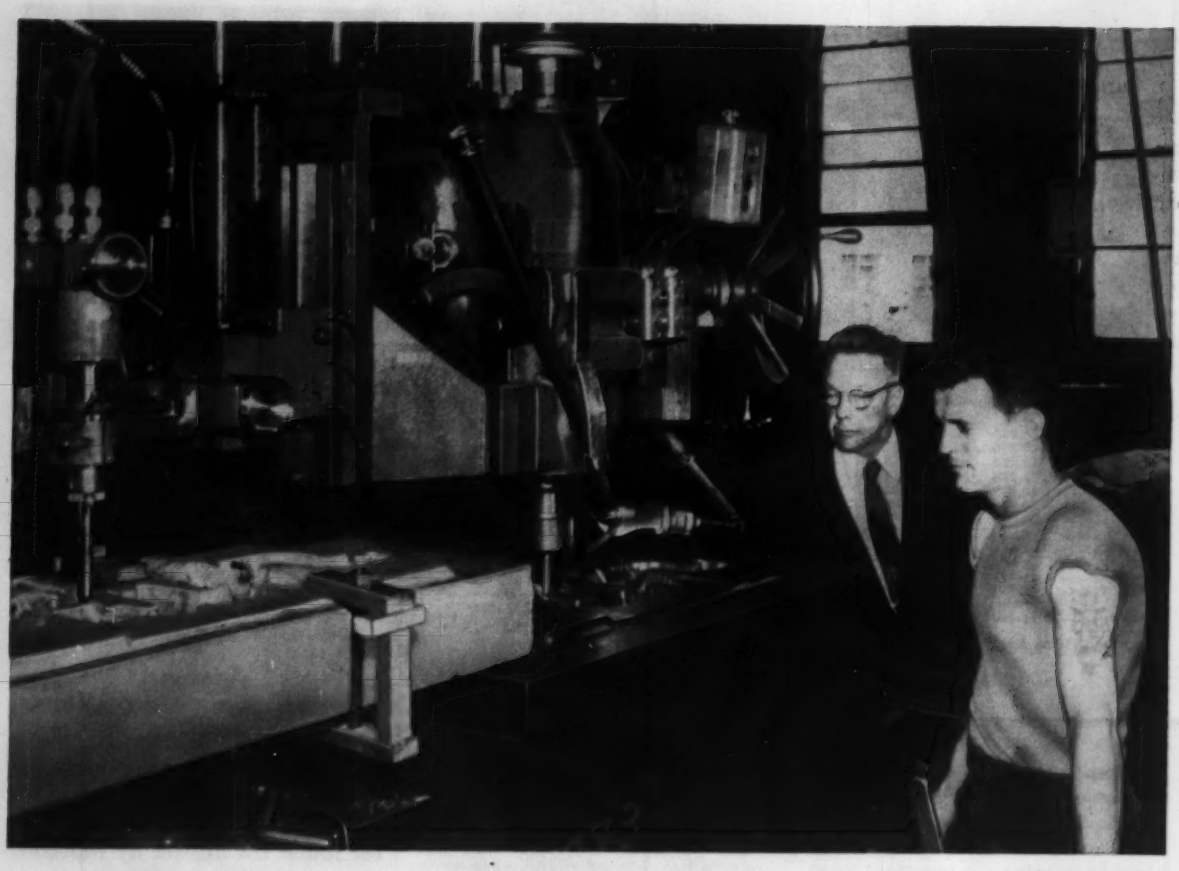
PUMP 65% HF & 40% H_2SO_4

Pumping 65% HF is tough enough, but when service requirements also include 40% H_2SO_4 the problem is really rough. An alert plant engineer found the answer by replacing two conventional pumps with one Vanton "flex-i-liner." He selected Model PX-60 with its Polyethylene block and ordered a gum rubber liner for the HF and a neoprene liner for H_2SO_4. Two trouble free plastic pumps in one! Details on request.

VALVES TO COMBAT CORROSION

75 questions and answers selected from Cooper Alloy Valve Clinics, cover materials, operations, service problems, installation and repair of stainless steel valves. This compilation, which originally appeared as a feature article in a leading Chemical publication is fast reading and good reference. Copies available on request.

COOPER ALLOY
HILLSIDE N.J.



precision demands the best material

The dependable quality of Hardtem Die Blocks is famous throughout the die sinking industry. Above is Mr. Larry Lucier, owner of the Commercial Die Co., in Detroit. Like so many other experienced die sinkers, Mr. Lucier uses Hardtem Die Blocks for the precision work that has earned his company's fine reputation.

That's why users buy and rely on Heppenstall Hardtem Die Blocks—for the consistent performance they can trust.

Here's what Hardtem Die Blocks mean to Better Production!

1. They're tough . . . they resist impact stress.
2. They withstand heat.
3. They are uniform in hardness.

Here's why Hardtem Die Blocks assure better results!

1. They're built of a special patented Heppenstall Steel.
2. They're carefully forged and heat treated to provide the wear resistance for which they are recognized throughout industry.
3. Their quality is under constant study and development by Heppenstall's Engineering and Research staff.

Make Hardtem your standard die block specification. Heppenstall Company, Pittsburgh 1, Pa. Sales Offices in principal cities.

HEPPENSTALL

. . . the most dependable name in die blocks

GEORGE E. McMAHON
. . . Vulcan Containers executive v. p.

N. P. SYNNESTVEDT
. . . Manistee Iron Wks. plant mgr.

WILLIAM D. SPAULDING
. . . Great Lakes Steel v.p.-operations

George E. McMahon fills the new position of executive vice president of **Vulcan Containers Inc.**, Bellwood, Ill. He was vice president in charge of all manufacturing departments and personnel.

Roy C. Heacock was made director of engineering, **Axelson Mfg. Co.**, division of U. S. Industries Inc., Los Angeles. He was vice president and director of engineering and manufacturing at Barber-Green Co.

Herbert W. Myers was made general sales manager, **Globe Forge Inc.**, Syracuse, N. Y., subsidiary of Barium Steel Corp.

Consolidated Engineering Corp., Pasadena, Calif., appointed **Kennett W. Patrick** director of its transducer division. He is succeeded as director of the systems division by **Harry E. Burke Jr.** **Walter B. Claus,** who directed the transducer division for the last two years, was assigned special projects for the manufacturing division.

J. Richard Hallock was made general purchasing agent, special products division, **Ford Motor Co.**, Dearborn, Mich.

James C. Mabe Jr. was made plant operations manager, **Chicago Pneumatic Tool Co.** He has headquarters in New York.

N. P. Synnestvedt was made plant manager of **Manistee Iron Works**, Manistee, Mich., division of Michigan Tool Co. **J. G. Maurer** was made shop superintendent. Mr. Synnestvedt, associated with Michigan Tool for 20 years, has been in charge of its purchasing activities.

Cooper-Bessemer Corp., Mt. Vernon, O., elected **Lawrence F. Williams** president and general manager to succeed **Gordon Lefebvre,** resigned. **James E. Brown,** treasurer, will also serve as secretary.

R. H. Johnson was elected president, **Ingersoll-Rand Co.**, New York, to succeed the late **D. R. Lowry. L. C. Hopton** becomes first vice president and secretary; **Herbert Cresswell,** comptroller; and **E. A. Keogh,** a director.

Frank Kiper was appointed president and general manager, **Michigan-Standard Alloy Casting Co.**, Detroit, a division of Consolidated Foundries & Mfg. Corp. He succeeds **Jack Bean,** resigned. Mr. Kiper was a vice president of Misco Corp. for the last two years.

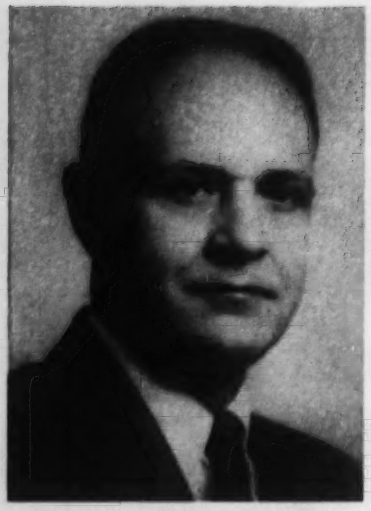
Alexander F. Mannella was named general superintendent of **Hamilton Standard Co.**, Windsor Locks, Conn. **Floyd V. White** was made superintendent-machining. **James I. Vandergrift** was named production superintendent at the Broad Brook plant.

William D. Spaulding was elected vice president-operations, **Great Lakes Steel Corp.**, Detroit, subsidiary of National Steel Corp. He is succeeded by **R. W. Grace** as manager of the steel works of **Weirton Steel Co.**, Weirton, W. Va., also a subsidiary. **G. K. Gordon** was made assistant manager of the steel works and **James J. Veselich** superintendent of the bessemer department. **Lee J. Wright** and **Martin E. Groat,** both formerly with U. S. Steel Corp. at the Edgar Thomson Works, joined Great Lakes Steel. Mr. Wright becomes assistant manager, primary production; Mr. Groat, superintendent of steel production.

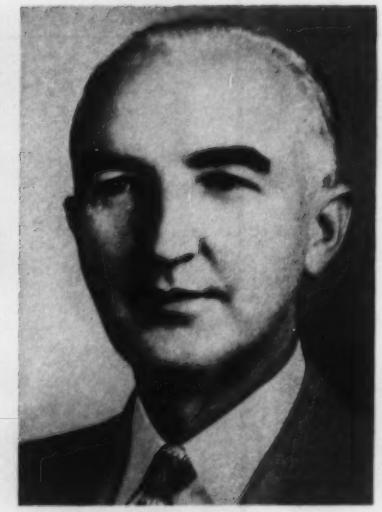
Dr. Lawrence R. Hafstad was elected a vice president, **General Motors Corp.**, Detroit, to succeed **Charles L. McCuen,** retired.

Newly created positions at **Square D Co.**, Cedar Rapids, Iowa, are filled by **L. W. Mercer** as senior vice president; **Henry S. Morgan,** financial vice president and secretary; **James Vaughan,** vice president-distribution equipment division. **T. R. Oakes** was made treasurer and assistant secretary.

Canadian Zurn Engineering Ltd., Montreal, appointed **John E. Shreve** managing director in charge of marketing, manufacturing and



V. V. NETCH
. . . welder sales mgr., Vickers Electric



ANGUS J. O'BRIEN
. . . Gar Wood v. p.-operations director

A. C. ERHARDT JR.
. . . National Tool sales director

warehousing operations in Canada.

V. V. Netch was named manager of welder sales for **Vickers Electric Division**, Vickers Inc., a unit of Sperry Rand Corp., St. Louis. He was vice president of Hill Equipment Engineering Co.

Lt. Col. W. H. Niles was elected vice president-sales of **East Coast Aeronautics Inc.**, Pelham Manor, N. Y., a subsidiary of Barium Steel Corp. He was with Sterling Precision Instrument Corp.

F. D. Parker was elected vice president-engineering, **Arthur G. McKee & Co.**, Cleveland. He was manager of the chemical plants division of Blaw-Knox Co. **H. G. Boucher** was made sales engineer in McKee's petroleum division.

Elwood B. Nelson was made general manager, coal mining division, **United States Steel Corp.**, Pittsburgh. Presently chief engineer of raw materials of the Tennessee Coal & Iron Division, he assumes this newly created post Oct. 1.

Theron S. Bushnell was made Midwest district manager, **Tube Turns Plastics Inc.**, Louisville. He has headquarters in Chicago.

J. V. McGuire was made manager, switchgear department, and **O. A. Haas**, manager of the heat transfer and water conditioning department at **Allis-Chalmers Mfg. Co.**, Milwaukee.

Angus J. O'Brien fills the new position of vice president and director of engineering and manufacturing, **Gar Wood Industries Inc.**, Wayne, Mich. He has been vice president and director of manufacturing since joining Gar Wood in 1949.

Robert B. Anderson was elected president, **Ventures Ltd.**, Toronto, Ont., world-wide mining company. He resigned last August as United States deputy secretary of defense. **Thayer Lindsley**, founder and retiring president of Ventures, is scheduled to become chairman of the board.

Dr. Clarence E. Larson was made vice president-research, **National Carbon Co.**, a division of Union Carbide & Carbon Corp., New York. He was director of the Oak Ridge National Laboratory, operated by Union Carbide for the Atomic Energy Commission. Dr. Larson will have headquarters in Cleveland at the new research laboratory now under construction.

John F. Bramham was made sales manager and **Hugh C. Bailey** manager of planning and production for **Pilgrim Drawn Steel Division**, Plymouth, Mich., Automotive Materials Corp. The appointments are effective Oct. 1.

Ralph E. Pettit, former vice president-works manager, Chicago Thrift Etching Corp., was named technical adviser in the metal industries department of **Diversey Corp.**, Chicago.

A. C. Erhardt Jr. was appointed director of sales, **National Tool Co.**, Cleveland. Since 1950 he has been chief service engineer. Mr. Erhardt succeeds **Joseph B. Clough** who leaves National Tool to start his own concern, Joseph B. Clough Co., manufacturers' representatives, Cleveland.

T. L. Theodorff was made Detroit district sales manager, Hamilton Press Division, **Baldwin - Lima-Hamilton Corp.** **John O. White** was made sales engineer for the foundry department, Philadelphia district.

Malleable Iron Fittings Co., Branford, Conn., named **Owen R. Huggins** manager of sales for its pole hardware division.

Following resignation of **Larry Hickok** as executive vice president at **Armstrong Furnace Co.**, Columbus, O., **George Zimbelman**, western division sales manager, Des Moines (Iowa) office, transfers to the Columbus plant as assistant general manager. **Charles L. Brooks** becomes sales manager.

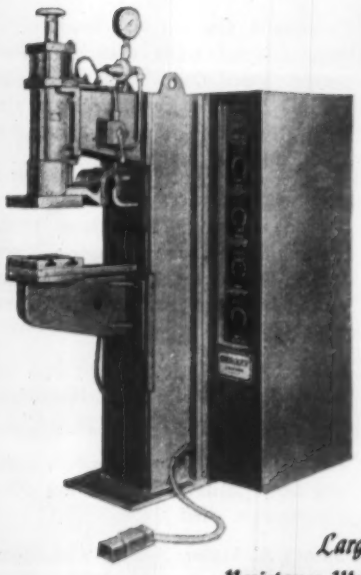
Jack T. Brereton was made assistant vice president-sales and service for **H. & H. Scrap Iron & Metal Co.**, Wauwatosa, Wis.

G. R. McWane joined **American Crucible Products Co.**, Lorain, O., as plant engineer. He was with Sandusky Foundry & Machine Co.

Herbert Ashcroft Jr. was made

FOR THE FIRST TIME A COMPLETELY NEW DESIGN OF SMALL, LOW PRICE SCIAKY WELDERS

Featuring all the Ruggedness, Dependability and Consistency of Operation Common to Sciaky Basic Thinking—Welders Designed to Do More Useful Work at Lower Operating Cost with Maximum Reliability!



EP-1 AIR OPERATED, PRESS TYPE, LOW IMPEDANCE, SINGLE PHASE PROJECTION WELDER

Through advanced design, mass production tooling, and complete use of integrated parts, Sciaky is introducing a complete new line of competitively priced, small, standard projection and spot welders. Check these important design features . . .

Pneumatic Double-Acting Cylinder Head
Recirculating Ball Bearing System Guided Ram
Side Mounted Sciaky Integral Control
Low Impedance Secondary Circuit
Sciaky High Efficiency Welding Transformer
Fabricated Frame with Heavy Vertical "T" Slotted Columns
Heavy, Fabricated Lower Arm
Silver-Plated, Laminated Flexible Shunt Conductor

For complete details and specifications on the EP-1 projection welder, or SP-1 spot welder, write for Bulletin 324-2.

Largest Manufacturers of Electric Resistance Welding Machines in the World

SCIAKY

SCIAKY BROS., INC. • 4909 W. 67th STREET • CHICAGO 38, ILLINOIS

WILLIAM W. WATSON
. . . Wagner Bros. Equipment p. a.

ROBERT C. KING
. . . heads new Electric Boat office

THADDEUS GISZCZAK
. . . factory mgr., GM central foundry

works manager, **Bausch & Lomb Optical Co.**, Rochester, N. Y. He joined the company in 1950 as chief industrial engineer.

William W. Watson was named director of purchases, inventory and budget control of **Wagner Bros. Equipment Co.**, Detroit. He was a buyer for Garland Mfg. Co.

Bill West joined the Dallas division of **Connor Spring Mfg. Co.** as sales engineer. **D. M. Bristol** was made office manager, San Francisco division.

John E. Schuler was made field manager, southern division, **Permacel Tape Corp.** He has headquarters in Charlotte, N. C.

L. G. Danielson was made Milwaukee district manager, industrial division, for **Harnischfeger Corp.**

Robert C. King was named to direct the new capital equipment control office of **Electric Boat Division**, General Dynamics Corp., Groton, Conn. He was machine tool control supervisor in the shipyard's machine shop.

Delmar Landen was made vice president-sales and **Clement Ratke** vice president-engineering, **Beaver Tool & Engineering Corp.**, Royal Oak, Mich. Working with Mr. Landen will be **Wilbur Weise**, newly named assistant vice president-sales.

Douglas B. Fraser was named manager of the Cincinnati plant of **Alco Products Inc.**

Jack E. Garnhart was made district sales manager and **William J. Stasko** sales engineer in the Chicago district for **E. W. Bliss Co.**

Thaddeus Giszczak was made factory manager, central foundry division, **General Motors Corp.**, at Defiance, O. He succeeds **Theodore R. Schroeder** who transferred to Pontiac Motor Car Division. Mr. Giszczak has been chief metallurgist at the Defiance plant since 1951. He is replaced by **Paul B. Guilford**, formerly at the Defiance chemical laboratory.

R. E. Cassatt joins **York Corp.**, York, Pa., as manager of commercial sales. He resigned as sales manager, refrigeration appliance division, Fedders-Quigan Co.

Thomas J. Gerwig was made Chicago district sales manager, **Republic Steel Corp.** He succeeds **Arthur R. Jones**, who will remain with Republic for several months in an advisory capacity.

OBITUARIES . . .

Robert A. Ott Sr., president and general manager, **Rogers Structural Steel Co.**, Corry, Pa., died Sept. 9.

George A. Beiswinger, 70, general superintendent and a director, **W. H. Nicholson Co.**, Wilkes-Barre, Pa., died Sept. 8.

James W. Ames, 75, chairman, **W. Ames & Co.**, Montclair, N. J., died Sept. 10.

Patrick Halloran, 72, president and founder, **Halloran's Brass Foundry Inc.**, Long Island City, N. Y., died Sept. 8.

Anthony H. Kramer, 81, chairman, **Advance Foundry**, Dayton, O., died Sept. 6.

Gosta Vennerholm, 56, assistant manager, manufacturing research department, **Ford Motor Co.**, Dearborn, Mich., died Sept. 9.

C. Harold Emerick, a partner and general manager, **H. A. Smith Machinery Co.**, Syracuse, N. Y., died Sept. 6.

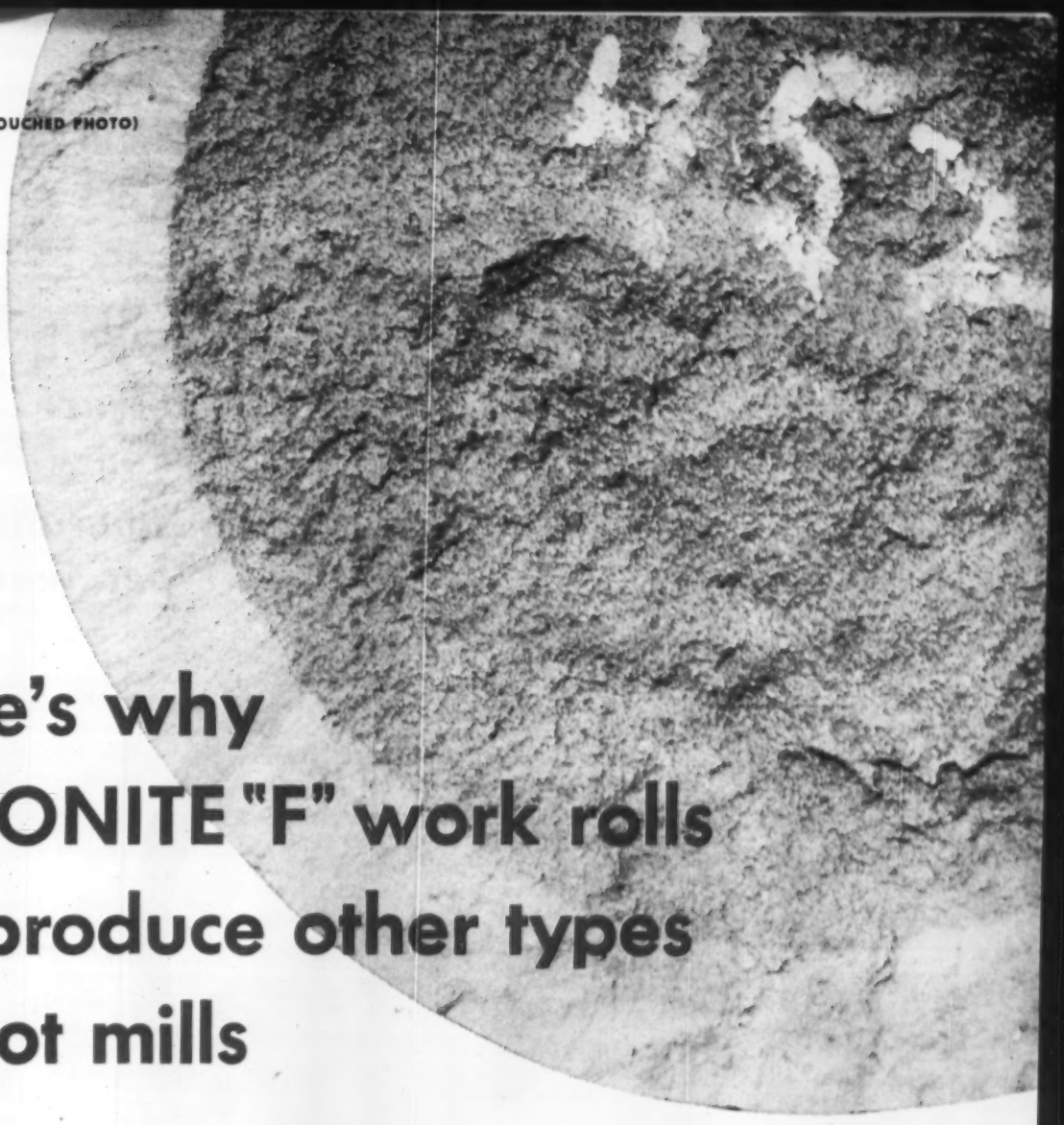
Clarence Mark, 72, former president and chairman, **Clayton Mark & Co.**, Evanston, Ill., manufacturer of electric weld pipe and tubes, died Sept. 6.

Frank C. O'Brien, chairman of **Burlington Steel Co.**, Hamilton, Ont., died Sept. 2.

Arthur G. Schuster, 64, structural engineer, **Rust Engineering Co.**, Pittsburgh, died Sept. 3.

James A. Slater, 42, sales engineer for **Rust Engineering Co.**, Pittsburgh, died Sept. 3.

(ACTUAL UNRETOUCHED PHOTO)



Here's why NIRONITE "F" work rolls outproduce other types in hot mills

Take a look at the close grain structure and deep shell of this test-fractured 21" diameter Mack-Hemp Nironite "F" work roll. You can actually *see* why Nironite "F" rolls give you greater tonnages between regrinds . . . why they offer greater resistance to banding... why they last all the way to worn-out diameter. So distinctive is this close grain structure that mill operators report that they can recognize Nironite "F" rolls by the continued good roll surface even after long use — whether or not they have seen the stripes on the wabblers.

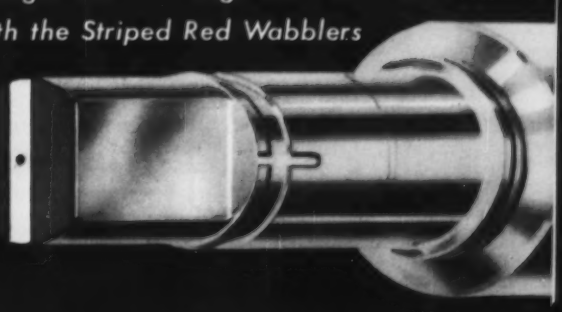
Nironite "F" rolls are high-nickel, high-chromium alloy grain type, double poured for maximum strength. They can be supplied in any desired hardness from 65 to 85 Shore scleroscope (C Scale).

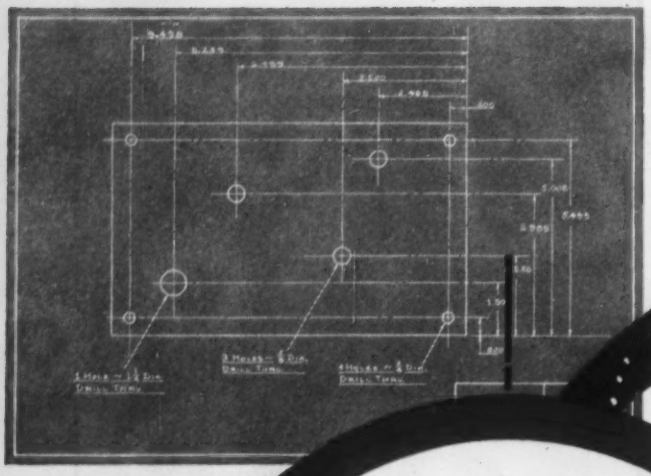
Mack-Hemp offers an entire series of Nironite nickel-chromium cast iron alloys for 2-high or 4-high hot mill roughing, intermediate and finishing rolls. Your Mack-Hemp sales engineer will be glad to give you assistance in choosing exactly the right type and hardness for your particular rolling problem.

MACKINTOSH-HEMPHILL
DIVISION OF
E. W. BLISS COMPANY
Pittsburgh and Midland, Pa.

cast mill rolls • Johnston cinder pots
rotary tube straighteners • Y-type cold mills
heavy-duty lathes • end-thrust bearings
steel and special alloy castings

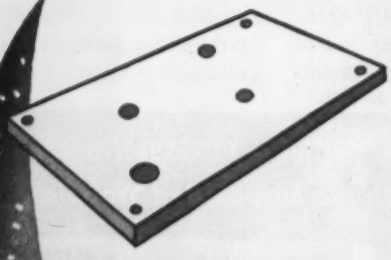
You get more tonnage from the rolls with the Striped Red Wabblers





this tape will save you $ thousands per year

the ARTER JIGMATIC



AUTOMATIC, TAPE CONTROLLED POSITIONING FOR VERTICAL DRILLING

From blueprint to finished piece — it's all in the tape! Your engineering department punches the tape for desired hole locations. All your operator need do is push the "Position" button, then drill the holes. Costly set-up time is practically eliminated. There are no jigs or fixtures; no stops to set. Savings in set-up time alone amount to thousands of dollars per year.

Write for Bulletin S55a.

ARTER grinding machine company WORCESTER, MASS.

Copperweld Grows

Facilities at each of its main divisions will be enlarged and improved. Cost: $12 million

COPPERWELD STEEL CO.'s $12-million modernization and expansion program at each of its main manufacturing divisions will be completed in 1957. Objectives: Increasing capacity, improving quality, reducing costs and broadening the product range. It will help the company meet increasing demands for quality alloy and carbon steel billets and bars, tubing and copper-covered steel wire products, officials say.

About $10 million will be spent on the Steel Division at Warren, O. (STEEL, Sept. 5, p. 72). Melting facilities will be improved and enlarged to a capacity of 660,000 tons of ingots per year. When completed, Copperweld will have four 65-ton and three 50-ton electric furnaces.

Finishing Capacity Up — Additions will be made to rolling and finishing facilities to give the company increased volume and a broader range of products. A 35-in., 2-high reversing primary mill will be installed, together with soaking pits of sufficient capacity to heat steel for this mill. The addition of annealing and straightening equipment also is contemplated. Upon completion of this project, it is estimated that shipments from this division could be increased about 40 per cent.

At the Wire & Cable Division, Glassport, Pa., about $1 million will be expended for improvements. The company makes a wide variety of copper-covered steel wire products at this plant.

Close to $1 million is earmarked for the Ohio Seamless Tube Division at Shelby, O., for auxiliary equipment to provide a wider range of seamless steel tubing products.

Eaton Opens Stamping Plant

Production was resumed Aug. 15 by the Stamping Division of Eaton Mfg. Co. in its new plant at 17877 St. Clair Ave., Cleveland. The plant was designed to meet increased demand from the automotive industry for the division's specialized stamped and plated products. At full production, the division's capacity will be increased about 40 per cent. The remodeling and moving project cost more than $3 million and included installation of new stamping, plating, automatic polishing, welding and tool devices. Major equipment installations were a million-dollar automatic nickel and chrome plating machine, with a 52,000-gal nickel solution capacity, and ten Minster presses of the 100-to-300-ton class.

Benchmaster Forms Division

Benchmaster Mfg. Co., Gardena, Calif., organized a Special Machinery Division to custom-develop machines related to its line of milling machines, punch presses, roll straighteners and accessory equipment.

Fairchild Buys Rhodes Lewis

Fairchild Engine & Airplane Corp., Hagerstown, Md., purchased Rhodes Lewis Corp., maker of aircraft accessories, from its parent firm, McCulloch Motors Corp., Los Angeles.

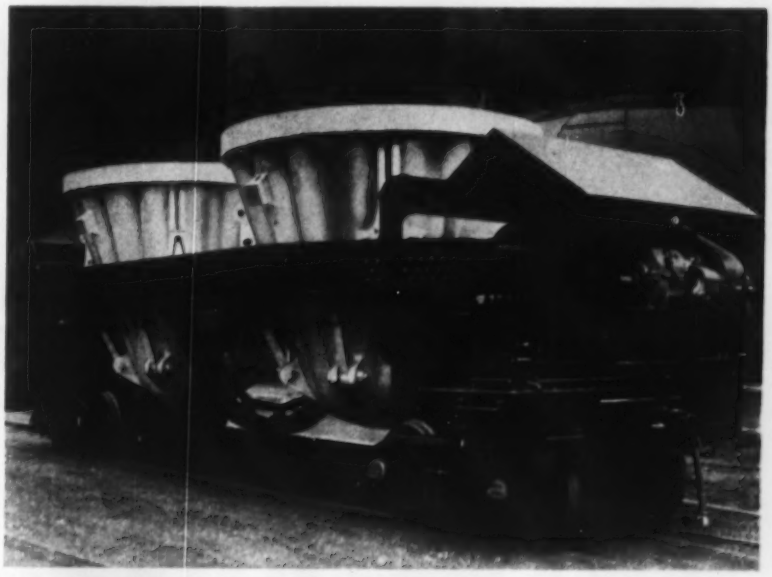
Lincoln Electric Gets Guaranty

The International Co-operation Administration has issued an investment guaranty to Lincoln Electric Co., Cleveland, covering the firm's investment in a French subsidiary, La Soudre Electrique Lincoln. A plant 10 miles southeast of Paris has been equipped by Lincoln to produce arc welding equipment for the European market. What guaranty means: Lincoln will be able to get back its investment in dollars; is insured against loss by expropriation.

Worthington Corp. Expands

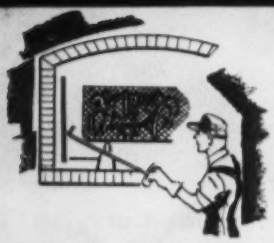
Worthington Corp., Harrison, N. J., purchased the 15-acre factory site owned by Crocker-Wheeler Electric Mfg. Co. in the Ampere section of East Orange and Newark, N. J. A dozen buildings, with over 330,000 sq ft of working floor space, were included in the sale. The property will be used to accommodate partially two of Worthington's major product divisions. Headquarters offices for engineering, sales and service for

(*Please turn to page* 100)

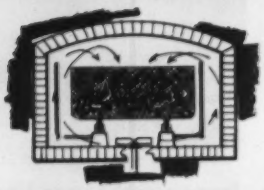


Improved Mounting Evolved for Slag-Carrying "Thimbles"

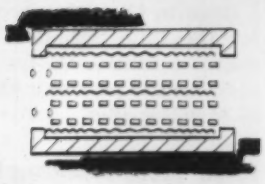
The life expectancy of cinder pots has been raised sharply by a new mounting method developed by E. W. Bliss Co.'s Mackintosh-Hemphill Division, Pittsburgh. A short support which bolts into lugs on the underside of the slag car's bail ring is available on Johnston corrugated cinder pots. The old-style support extends up between the sides of the pot and bail ring, hooking over the ring's top from the inside. With the new method, there is no chance for the pot to scrape against the backs of the supports during transit from steel plant to slag dump



Safety! Extremely iow voltage makes CORRTHERM elements completely safe. Let operator or work load bang it if they will. Neither element nor operator will be hurt.



CORRTHERM elements act as natural baffles to direct forced convection streams through the charge. The use of electric furnaces for carburizing and carbonitriding is now practical.



In continuous type furnaces CORRTHERM elements hang between lines of work as well as on side walls. Note how closer corrugations (at each end of element) compensate for incoming cold work and door losses.

NEVER BEFORE ANY ELECTRIC ELEMENT LIKE THIS NEW ONE BY LINDBERG

On the opposite page is a photograph of Lindberg's new CORRTHERM element for electric heat treating furnaces. You can see how radically advanced this element is over anything now used.

Wherever electricity is the preferable source of heat for metal treating the CORRTHERM element now makes its use practical, efficient and economical.

And this includes carburizing and carbonitriding furnaces, too! Problems created by the use of electricity in these types of furnaces are well known. CORRTHERM elements eliminate them completely. These facts tell you how and why:

LOW VOLTAGE: Operates at extremely low voltage. No leakage through carbon saturation. Around Lindberg we talk about it as the electric element "without any electricity...to speak of!"

ATMOSPHERE CIRCULATION: Elements act as baffles to direct circulation of convection streams.

SAFETY: Extremely low voltage also eliminates shock or short hazards.

DURABILITY: Watts density at all-time low. Element practically indestructible. Work load or operator's charging tool can't hurt it.

EASILY INSTALLED: Element is not enclosed, just hangs in furnace. No complicated mountings required.

CORRTHERM, Patent No. 2694740 (other patents pending), was developed in Lindberg laboratories, by Lindberg metallurgists and engineers. To find out just how its advantages can be applied to your heat treating processes get in touch with your Lindberg Field Representative. (See classified phone book.)

LINDBERG ENGINEERING COMPANY

2441 West Hubbard Street, Chicago 12, Illinois

Los Angeles Plant: 11937 Regentview Ave., at Downey, California

No retort needed in pit-type carburizing furnace with CORRTHERM elements. Again see how elements serve as baffles to direct forced convection stream through charge.

CORRTHERM

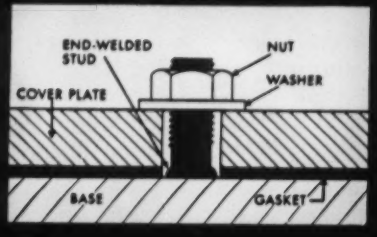
by LINDBERG

"STUD" NELSON SECURES

COVER PLATES IN A FLASH!

Pfft! A split second with a NELWELD® gun and you've got a sturdy end-welded stud right where you want it . . . ready to line up with the cover plate hole. That's real speed!

Multiply the saving in time by the number of fastening locations on your product. Add what you save by eliminating drilling and tapping; then figure the heavy bosses you won't need.



NELSON® studs . . . used to hang, handle or hold . . . come in many shapes, types and sizes.

Nelson Field Engineers, all cost-reduction specialists, operate from a nationwide chain of field offices and warehouses. They're trained to efficiently handle all your needs for studs, equipment, or fastener engineering. Write for details.

Stud Nelson

Fasten It Better at Less Cost with

NELWELD

NELSON STUD WELDING
2714 Toledo Avenue
Lorain, Ohio

Please send more information on cost-saving stud welding applications.

NAME _____

COMPANY _____

ADDRESS _____

CITY AND STATE _____

NELSON STUD WELDING DIV. OF GREGORY INDUSTRIES, INC. LORAIN, OHIO

(*Concluded from page 97*)

the Air Conditioning & Refrigeration Division will be moved to the Ampere site. M. M. Lawler is vice president in charge of that division. V. de P. Gerbereux, general manager of the Standard Pump Division, eventually will make his headquarters at the Ampere site.

Crocker-Wheeler Division of Elliott Co., Jeannette, Pa., maker of motors and generators, recently moved to Jeannette.

ARco Steel Fabricators Formed

ARco Steel Fabricators Inc. has been organized as a subsidiary of Automotive Rubber Co. Inc., Detroit. Heading ARco Steel is R. A. Jackson, general manager. The firm will specialize in design, fabrication, assembly, construction, installation of processing equipment for every phase of industry.

Becco To Expand Facilities

Multimillion dollar plant expansion programs, involving the hydrogen peroxide producing facilities at Vancouver, Wash., and Buffalo of Becco Chemical Division, Food Machinery & Chemical Corp., Buffalo, have been announced.

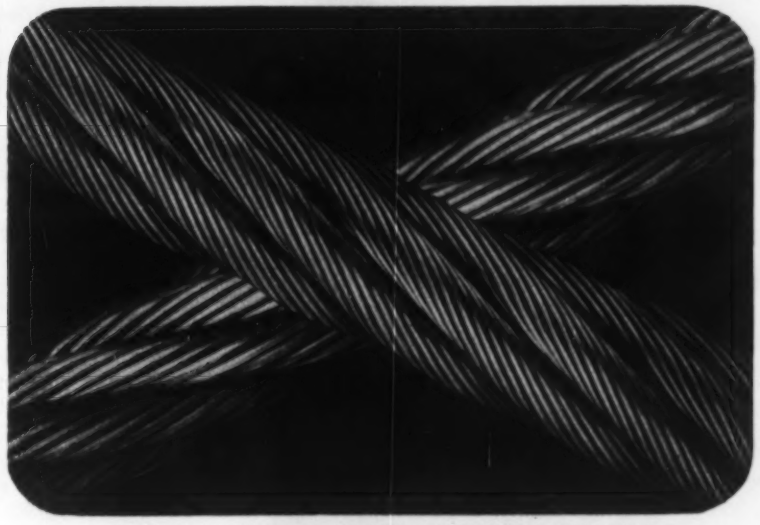
Superior Steel Opens Plant

Superior Steel Products Corp., Milwaukee, opened a branch plant at Plainville, Conn. The plant, managed by Edward Janiszewski, specializes in assembling die sets. Operations will be expanded soon to include complete facilities for designing and manufacturing precision die sets and supplies for the eastern market. Harding Bros., Boston, is the exclusive distributor for the Connecticut plant.

Talon Buys Universal Button

Talon Inc., Meadville, Pa., has entered the metal button and snap fastener field by acquiring Universal Button Co., Detroit and Tecumseh, Mich., and its Canadian subsidiary at Windsor, Ont. M. Stuart Ramsey has been named vice president and general manager of Universal Button Co.; Joseph White, vice president and sales manager.

FIRST WE DEVELOPED 1105 ROPE WIRE.



THEN WE MADE ROEBLING'S

Royal Blue

WIRE 1105 ROPE

1105 takes Royal Blue out of the ordinary wire rope class.

1105 is a rope wire that's new—that's stronger. It's the biggest news in many years.

1105 is the result of more than a century of research and development—it's the wire that gives Roebling Royal Blue the stamina that pays off in service.

Contact your Roebling distributor or write us for the full story.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

PUT MUSCLE behind your BLAST CLEANING

Does your present abrasive have muscle enough to prove itself in performance? You can't judge an abrasive by looks, claims or promises. The only test of any abrasive is its *cost per ton of castings cleaned.* Because of exclusive metallurgical characteristics, Malleabrasive gives you the lowest cost per ton cleaned of any premium abrasive on the market! This has been proved in hundreds of production tests by users throughout the country. Prove it in your own production test —put muscle behind *your* blast cleaning with Malleabrasive! *We GUARANTEE that Malleabrasive will give you lowest cost per ton of castings cleaned.*

To order Malleabrasive, or for additional information on running a test, contact Globe Steel Abrasive Co., Mansfield, Ohio.

U. S. Patent #2184926 (Other patents pending)

MALLEABRASIVE®

Enters Atomic Field

Pomeroy heads Thompson Products group to exploit developments in nuclear field

THOMPSON PRODUCTS INC., Cleveland, manufacturer of aircraft, automotive and electronic products, has entered the atomic energy field. The company has established a central staff department "to seek out, investigate and exploit" new developments in the nuclear field, says Arch T. Colwell, vice president.

The new group is headed by A. L. Pomeroy, associate director, staff research and development. Serving with him as manager of atomic projects is H. L. Browne, formerly on the staff of the Atomic Energy Commission's Santa Fe, N. Mex., operations.

United Effort—The group brings together a knowledge of Thompson Products' capabilities and interests with a knowledge of what is going on in the nuclear energy field, Mr. Colwell says. It will promote the sale of established company products, modified to take into account the special problems of atomic energy uses.

Components—The long-range objective of the group is to promote the sales of items especially designed for the atomic age. This will be accomplished by an aggressive campaign to seek contracts to engineer, develop and produce specialized mechanical and electronic components.

The department will survey small companies now active in the nuclear energy field with the thought of acquirement as a means of expanding into atomic energy products.

The economics of nuclear power will hinge to a considerable degree upon the ingenuity of the parts and equipment manufacturers, Mr. Colwell says. As in the development of other complex equipment, the development of a reactor requires close co-ordination and interchange of ideas between designers and fabricators.

Toolmaker Opens Branch

Cleveland Pneumatic Tool Co., that city, opened a sales and service branch at 3000 Hempstead

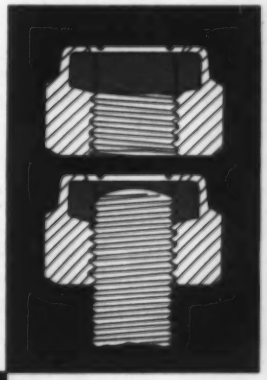
What's special about this STOP NUT?

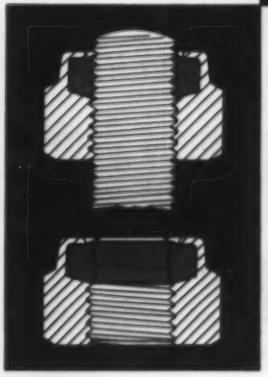
Several things make this nut unusual. For instance, you can "stop" it at any position on the threaded length of the bolt . . . or wrench it tight against the work where it protects bolt threads against corrosion and prevents liquid leakage. No matter where you leave it on the bolt, it will remain tight in that exact position, even though you subject it to heavy vibration and shock loads. But use a wrench on it and it comes off as easily as it went on. The red locking collar is nondestructive—does not gall bolt threads or remove plating. You can remove it and re-use it again and again.

What gives it its grip?

1 The locking collar is unthreaded and elastic. It has an inside diameter smaller than the major diameter of standard bolts.

2 The bolt impresses a mating thread into the collar and the resulting compressive forces exert a constant friction grip on the bolt. . . .





3 and exert a downward thrust bringing the lower flanks of the bolt thread into firm metal to metal contact with the matching nut threads, eliminating normal axial play.

4 Nut is removable and reusable . . . the Red Elastic Collar retains its grip after repeated usage.

Will it hold under ALL conditions?

The locking principle of the Elastic Stop® nut has been tested and proved by over 25 years of actual field service. Elastic Stop nuts are used on locomotives . . . and pile drivers. They fasten hedge shears and harvesters, drilling rigs and washing machines, trucks and roller skates. And no Elastic Stop nut customer has ever stopped using them because of unsatisfactory performance.

What about sizes and materials?

Elastic Stop nuts are available from a watchmaker's 0-80 all the way to 4"—in materials that include stainless steel, brass, aluminum and other alloys. Protect your product with "fastener insurance." Try Elastic Stop nuts on trouble spots, whether to protect expensive heavy equipment from costly downtime or to guarantee the accuracy of delicate electrical equipment by maintaining precision adjustments. We'll supply free test samples.

ESNA®

ELASTIC STOP NUT CORPORATION OF AMERICA

Dept. N82-960, 2330 Vauxhall Road, Union, N. J.

Please send the following free fastening information:

☐ ELASTIC STOP nut bulletin

☐ Here is a drawing of our product. What self-locking fastener would you suggest?

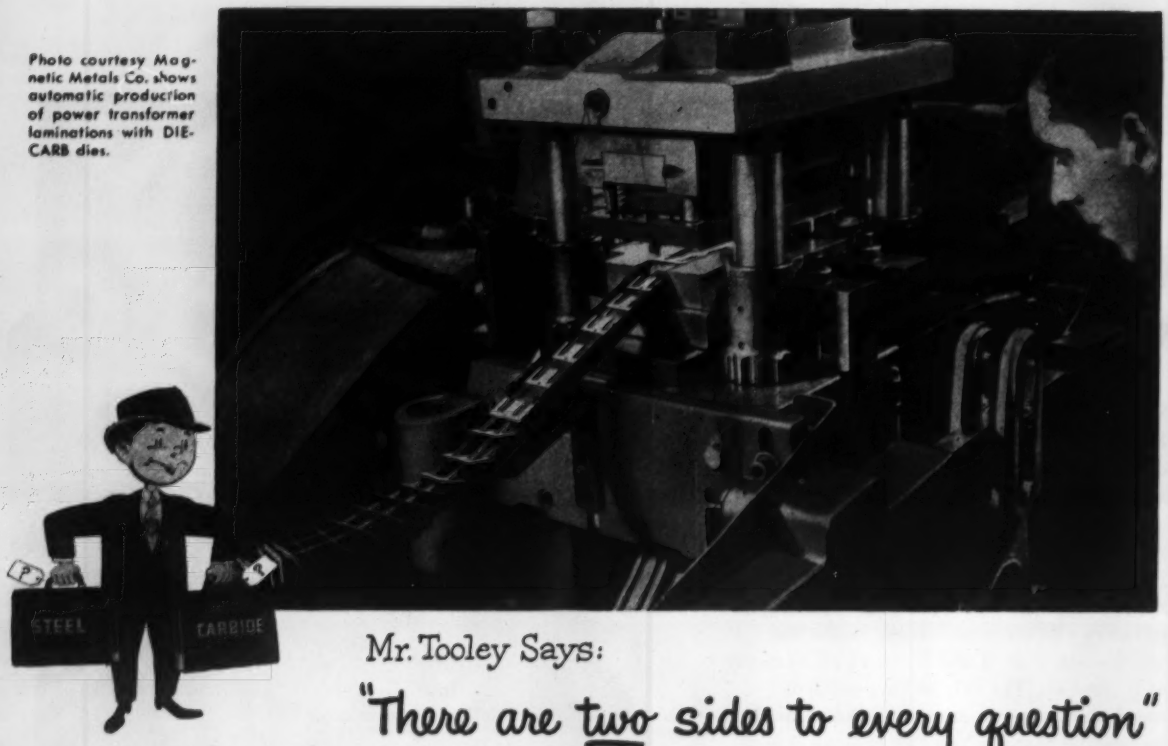
Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____

Photo courtesy Magnetic Metals Co. shows automatic production of power transformer laminations with DIECARB dies.



Mr. Tooley Says:

"There are two sides to every question"

CROMOVAN

HIGH CARBON—
HIGH CHROME STEEL

- Tougher edge
- Better edge wear
- Safe to heat treat
- Easier to machine

DIECARB

THE HIGH PRODUCTION CARBIDE

- Made expressly for blanking and lamination dies.
- High resistance to shock and abrasion.
- Low regrinding cost.
- Greater production per die life.

The question of which die material to use for blanking and laminating operations involves a choice of either *steel* or *carbide.* Consideration must be given to the factors which determine die life, such as abrasiveness of the material to be worked, burr limit, distortion of product or elimination of subsequent machining operations.

In the selection and purchasing of die materials, Firth Sterling offers you *unique* advantages because it manufactures *both* steel and carbide. From *one* dependable source of supply you are assured of completely *un*biased recommendations and the *right* steel or carbide or *both* for every die making need.

Typically, Firth Sterling DIECARB and Firth Sterling CROMOVAN (die steel) are widely used for blanking and laminating operations, depending upon job requirements. Write today for literature and unbiased recommendations for your specific needs.

VISIT OUR BOOTH No. 1026 A. S. M. SHOW, PHILADELPHIA

R-310

Firth Sterling

—INC—

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

MILLS: McKEESPORT, TRAFFORD, DETROIT, HOUSTON
OFFICES AND WAREHOUSES*: BIRMINGHAM CHICAGO* CLEVELAND DAYTON DETROIT* HARTFORD* HOUSTON LOS ANGELES* NEW YORK PHILADELPHIA PITTSBURGH WASHINGTON WESTFIELD, N.J.

PRODUCTS OF FIRTH STERLING METALLURGY

High Speed Steels
Tool & Die Steels
Stainless Specialties
High Temperature Alloys
Sintered Tungsten Carbides
Firth Heavy Metal
Chromium Carbides
High Temperature Cermets
Zirconium

CALL YOUR FIRTH STERLING DISTRICT OFFICE OR DISTRIBUTOR. ASK MR. TOOLEY

Turnpike, Levittown, Long Island, N. Y. It is under the direction of T. J. Baker.

Machine Tool Builder Expands

Cross Co., Detroit, builder of automation machinery and special machine tools, will double its production capacity. It will erect a $4-million office building and factory—one of the first in the area designed with protection against atomic radiation in mind, says M. O. Cross Jr., president. The plant will be on 14 Mile road and Grosbeck highway.

Weltronic Changes Name

Weltronic Induction Heating Corp., Oak Park, Mich., changed its name to Welduction Corp. The firm makes induction heating and automatic arc welding equipment.

L. B. Foster Opens Warehouse

A six-acre warehousing area for fabrication and storage of steel sheet piling, pipe and railroad trackage has been opened at 1200 Allene Ave., Atlanta, by L. B. Foster Co., Pittsburgh.

Walworth Buys Alabama Firm

As a major step in its diversification and expansion program, Walworth Co., New York, manufacturer of valves and fittings, purchased M & H Valve & Fittings Co., Anniston, Ala., maker of valves and hydrants. The company also is establishing a Research & Development Division at Boston to speed development of "nuclear plumbing"—valves and fittings designed for use in nuclear power systems. Dr. Forest C. Monkman Jr., a specialist in metals testing and research, has been named to direct the research program.

NEW ADDRESSES

Metal & Thermit Corp.'s United Chromium Division, New York, established warehousing facilities at 415 E. 151st St., East Chicago, Ind. United Chromium's Chicago

(*Please turn to page* 108)

CHICAGO TRAMRAIL

TRAK-RAK cuts cost of

BAR STOCK HANDLING 66.3%

employing 2 men where 4 were formerly required . . . with 100% selectivity of material

An improved, simplified, and radically different method of handling bar stock is now in use which replaces the usual difficult and costly method of storing bar stock in pigeon hole racks and removing only a bar or two at a time.

Utilizing the TRAK-RAK Crane System, bar stock is assembled in unit loads placed in containers or baskets which are stored in fabricated tree-type racks on each side of narrow aisles. To remove one or more bars, the container is lowered to the floor, the bars removed and the container with the remaining bar stock placed back in its designated location in the storage racks. The entire movement is one-man, pendant push-button controlled from the floor and it is now possible for the saw man to select his own material and place it directly upon the saw table.

This TRAK-RAK Crane System operates in a 4 ft. 6 in. aisle and stores the material eleven high. The same crane incorporates interchangeable forks which allows the crane to handle palletized material as well as bar stock in the same area.

Write today for TRAK-RAK applications —a 20-page illustrated booklet explaining the TRAK-RAK Handling and Storage System; illustrates and describes installations for handling many diverse materials in fourteen widely different industries.

CHICAGO TRAMRAIL CORPORATION

1326 SO. KOSTNER AVENUE • CHICAGO 23, ILLINOIS

WHICH OF THESE TAPES can save

1. TAPE you can SEE through!
"SCOTCH" Brand Cellophane Tape—12 colors and transparent—is crystal-clear and sticks at a touch for hundreds of holding, bundling, and repairing jobs.

2. TAPE that takes CURVES!
"SCOTCH" Brand Masking Tapes have flexible creped backings that let them conform to curves and irregular surfaces—makes them superior for paint masking, suitable for hundreds of holding, bundling, and sealing jobs.

3. WORLD'S STRONGEST TAPE!
"SCOTCH" Brand Filament Tape offers up to 500 lbs. tensile strength per inch of tape width. For every heavy-duty bundling, holding, and reinforcing job.

4. TAPE that sticks on BOTH SIDES!
"SCOTCH" Brand Double-Coated Tapes solve many holding, bonding, laminating, and mounting problems. Easy-to-apply; tight-holding on *both* sides!

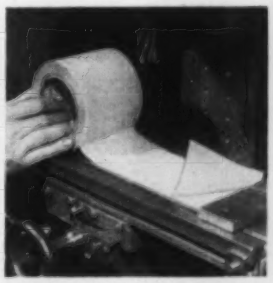
5. TAPE that STOPS MOISTURE!
"SCOTCH" Brand Acetate Fibre Tape—long-aging, moisture-and-weather resistant . . . sticks at below-freezing temperatures. Comes in 12 colors and transparent.

6. COLORS that roll on DRY!
"SCOTCH" Brand Plastic Tapes come in eight vivid colors; are thin, tough, stretchy, long-wearing; resist acids, alkalies, greases, abrasion, common solvents.

the most...do the most...for you?

● It depends on your problem! "SCOTCH" Brand Pressure-Sensitive Tapes can hold, mask, protect, seal, bind, bond, palletize, decorate, identify—handle hundreds of different types of jobs for metal processors. And handle these jobs quickly, easily, inexpensively. What's more, nearly all tape applications can be made with automatic or semi-automatic equipment if desired. Such equipment can often change a manual operation into a mass production step overnight. Here are just a few ways "SCOTCH" Brand Tapes can help solve problems and cut costs for you:

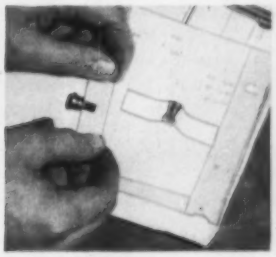
PLASTIC tapes mark lanes for traffic, define storage areas, lay out production-flow patterns. Apply to any clean, dry surface in minutes—no shutdowns. Last up to 2 years and longer.



DOUBLE-COATED tapes provide a sticky surface to hold small parts or units for various operations. Above: tape applied to bed of milling machine eliminates need for clamp set-up.

FILAMENT tape can secure odd-shaped parts quickly and easily with just a few quick wraps. "SCOTCH" Brand Filament Tape has an exclusive "mirror-surface" adhesive that sticks at a touch; parts can't come loose. Tape won't scratch or mar soft metals; strips off clean with no adhesive residue.

MASKING tape, used for either selective or stop-off masking, makes any painting operation faster, cleaner, easier. Above: special "SCOTCH" Brand High-Heat Masking Tape used for bake-oven operation withstands temperatures up to 375°F.



CELLOPHANE tape holds small parts on job tickets or blueprints. Crystal-clear tape allows immediate identification of part; does not obscure printing

ACETATE FIBRE tapes can be *printed* to identify parts. Roll is kept in bin with part—correct label is quickly applied to carton or to part itself.

SEE YOU at booth 1668, 37th National Metal Exposition and Congress, Philadelphia, October 17-21!

There are more than **300 PRESSURE-SENSITIVE TAPES** for industry, trademarked...

REG. U. S. PAT. OFF.

SCOTCH

BRAND

The term "Scotch" and plaid design are registered trademarks of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Export Sales office: 99 Park Ave., New York 16, N. Y. In Canada: P. O. Box 757, London, Ontario.

GET "SCOTCH" BRAND TAPES FROM YOUR REGULAR DISTRIBUTOR OR MAIL THIS COUPON FOR FURTHER INFORMATION

MINNESOTA MINING AND MFG. CO. GK-95
St. Paul 6, Minn.

Please send me complete information on the "SCOTCH" Brand Tapes checked:

—1—2—3 — Automatic and Semi-Automatic
—4—5—6 application equipment

NAME.....

COMPANY.....

ADDRESS.....

CITY.....ZONE...STATE.....

You can solve your **tough** corrosion problems by using Bitumastic® Coatings

Here is a porous surface being protected by Bitumastic® No. 50. This heavy-duty coating—applied over a primer—builds up a barrier that cannot be penetrated by moisture and corrosive elements in the soil.

TOUGH CORROSION PROBLEMS can be solved, but not by using ordinary paints or conventional protective coatings. For long-term protection, it takes *specialized* protective coatings . . . the Bitumastic Coatings Koppers makes.

Bitumastic Protective Coatings are specially formulated from a tar-pitch base* that is, for all practical purposes, impervious to moisture. These coatings keep moisture away from exposed metal surfaces . . . and that's the *best* way to stop corrosion.

With tough, durable Bitumastic Protective Coatings, a thickness up to eight times that of ordinary paints can be obtained in one application. Where other factors are equal, the *thicker* the coating the *longer* the period of protection.

Send for a set of free booklets describing the family of Bitumastic Protective Coatings. At the same time, tell us about *your* corrosion problems so that we can suggest a satisfactory solution. There is no obligation, of course.

**Hi-Heat Gray is a non-coal-tar vehicle and metallic pigment.*

KOPPERS COMPANY, INC.
Tar Products Division, Dept. 978-T Pittsburgh 19, Pennsylvania
DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK, PITTSBURGH, AND WOODWARD, ALA.

MADE ONLY BY KOPPERS
BITUMASTIC PROTECTIVE COATINGS
SOLD THROUGH INDUSTRIAL DISTRIBUTORS
KOPPERS ®

(*Concluded from page* 105)

sales office, previously at 208 S. LaSalle St., was moved to East Chicago. Willard Carter is Chicago sales manager.

Broderick & Bascom Rope Co., St. Louis, moved its eastern branch and warehouse to larger quarters at 270 North St., Teterboro, N. J.

Wolverine Tube Division, Calumet & Hecla Inc., Detroit, moved its Long Island mill depot to more spacious quarters at 42-02 11th St., Long Island City 1, N. Y. G. H. Tobelman is eastern district sales manager.

Pullman Vacuum Cleaner Corp. moved to a larger plant at 25 Buick St., Boston. The firm recently purchased Electric Blower Co., that city.

REPRESENTATIVES

Inland Steel Products Co., Milwaukee, maker of steel building products, appointed E. G. Fletcher and J. H. McIver, sales representatives in the Los Angeles branch area.

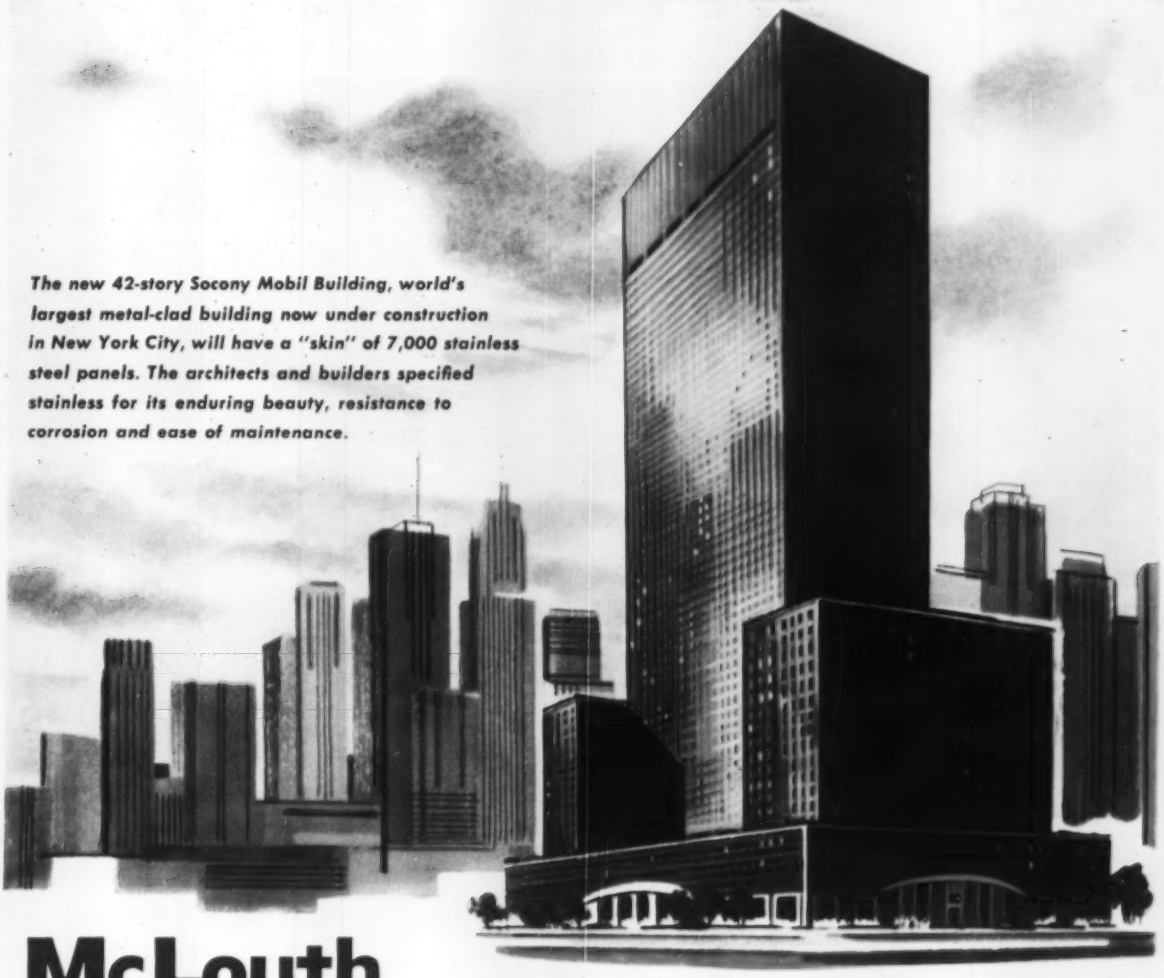
Standard Wire & Cable Co., Los Angeles, was appointed sales representative on the West Coast for **Garfield Wire Division** of **Overlakes Corp.**, New York.

Galion Allsteel Body Co., Galion, O., appointed South Texas Truck Equipment Inc., Houston, and Atlas Truck Equipment & Bus Co., Milwaukee, as distributors of its hydraulic hoists and dump bodies. The Galion firm is an affiliate of Central Ohio Steel Products Co.

Laclede-Christy Co., St. Louis division of **H. K. Porter Company Inc.**, Pittsburgh, appointed D. C. Wright as field sales representative in the Birmingham territory for its four lines of refractories.

Vanton Pump & Equipment Corp., division of Cooper Alloy Corp., Hillside, N. J., appointed Backus & Spencer, Cleveland, Unit Process Co., Seattle, and D. B. Gooch Associates, Birmingham, sales representatives.

modern design specifies stainless steel



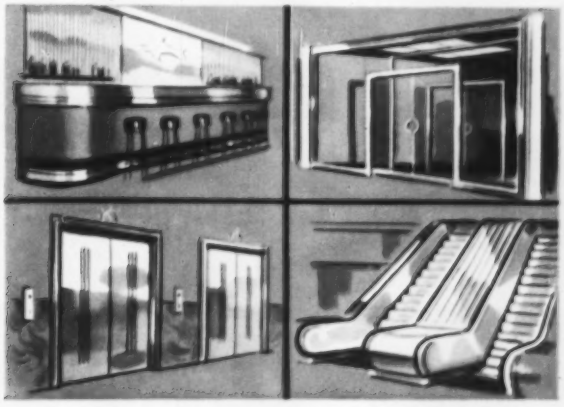
The new 42-story Socony Mobil Building, world's largest metal-clad building now under construction in New York City, will have a "skin" of 7,000 stainless steel panels. The architects and builders specified stainless for its enduring beauty, resistance to corrosion and ease of maintenance.

McLouth STAINLESS Steel

for buildings

In fixtures, trim, curtain walls and hundreds of other applications you will profit by using McLouth Stainless Steel.

For the product you make today and the product you plan for tomorrow specify McLouth high quality sheet and strip Stainless Steel.



McLouth Steel Corporation

Detroit, Michigan

MANUFACTURERS OF STAINLESS AND CARBON STEELS

I Nearly Blew My Top!

"The other day the Detrex man pointed out to me that metal cleaning and surface preparation accounts for ¼ to ⅓ of all the operations in the average metal-working plant. It sure caught me by surprise and, frankly, it started me thinking about our own plant. After a complete survey we found over ¼ of all our operations were of that type.

"What was immediately apparent to me was how important even the smallest single savings would become when multiplied by the number of operations involved. It certainly changed my way of thinking on the importance of metal cleaning and surface preparation. When I think of how little regard we had been giving those operations, *I nearly blew my top.*

"Take, for example, our metal parts washing operations. By switching to Detrex cleaners we were able to effect savings of a size we never before thought possible. One of the things that really impressed us about Detrex Emulsions was the fact that they not only do an excellent job of cleaning but they also retard rust . . . and all in one operation. That alone saved us considerable money.

"Why don't you let the Detrex man in your area make the same type of survey in your plant? It isn't going to cost you a penny if he doesn't show you how you can save money. If he does, you'll probably buy some chemicals and/or equipment, but more important you'll be saving big dollars. You have nothing to lose and everything to gain. Why not give him a crack at it next time he calls?"

**Detrex alkaline and emulsion cleaners have reduced manufacturing costs in hundreds of plants. They provide better and more positive cleaning action... faster and at lower cost.*

Service with a Saving!

DETREX CORP.

Dept. 401 • Box 501, Detroit 32, Mich.

DEGREASERS • DEGREASING SOLVENTS • WASHERS
ALKALI & EMULSION CLEANERS • DRYCLEANING
EQUIPMENT • PHOSPHATE COATING PROCESSES

STEEL

September 26, 1955

Technical Outlook

DC STAGES COMEBACK—The trend to more direct-current drives in industry has motor builders agog. Since World War II, sales of d-c motors in the 1 to 200 hp sizes have jumped 85 per cent while sales of all motors in that size range have risen only 20 per cent. Reason: There just isn't any better source of precisely controlled adjustable speed for continuous-process machines. Packaged adjustable speed drives, utilizing either motor-generator sets or rectifiers, are selling like hotcakes.

SPRAY SAVINGS—Flame metallizing worn parts is cutting maintenance costs 50 per cent for an Atlanta, Ga., seller and servicer of crawler tractors. One man spends half his working hours building up worn brake drums, crankshafts and axles that formerly were discarded. A bakery has him renovate its stainless steel dough-mixing shafts regularly.

COMPLEX GAGING—Parts too difficult for inspection on contour projectors are being gaged accurately by reticle tracing fixtures. The part is not projected; only an actual-size outline of the part, with tolerances, appears on the comparator screen. Principal advantages: Projection is independent of part size; any desired magnification can be used. Inspection possibilities include hole locations, recesses, undercuts, internal profiles and cam surfaces.

ATOM FUEL—What's the best method for making radioactive fuel to serve reactors for large-scale electrical production? Of four suggested methods—precipitation, ion exchange, fractional distillation and pyrometallurgical—the last (and least developed) looks highly promising. Irradiated uranium and plutonium are processed in the metallic state in a specially shielded furnace. Fission products are removed by methods similar to steelmaking procedures. Purified fuel elements are cast directly from the furnace.

LOW PRESSURE MELTING—Consumable electrode arc melting in inert atmospheres, used to produce titanium ingots and now being tried for zirconium, benefits by reduced atmosphere pressure, a Bureau of Mines study indicates. Improvements in electrical efficiency, ingot quality, metal yield and arc stability were observed during reduced pressure melting of zirconium.

STAYING CLEAN—There's not much point in a dirt-free assembly area if you bring in dirty materials, GE thinks. That's why parts coming into its aircraft accessory turbine assembly department arrive packaged in plastic bags, or covered with a polyethylene sheet.

NEW APPROACH—The National Bureau of Standards has developed an accurate procedure for analyzing cobalt-base jet engine alloys by ion exchange. Its basis: Differential retention of metal ions on the surface of resins. The method can be used to determine nickel, manganese, cobalt and iron in the presence of columbium (niobium), molybdenum, tantalum, tungsten, silicon and copper.

QUALITY PLASTIC—Physical limits of plastics keep spreading. Polyethylenes are available with tensile strength of 6000 psi, a stiffness modulus of 150,000 psi and the ability to withstand constant temperatures of 250°F and not become embrittled at −170°F.

Metalworking Outlook—p. 63 *Market Outlook—p. 159*

Sintered Ore—New Glow in Blast Furnace

By THOMAS F. HRUBY and ROBERT M. LOVE
Associate Editor Pittsburgh Editor

News and Views of Sintering

"The future of sintering is already here. The advantages are plain for anyone to see. Only availability of more sinter holds down our proportional use of it in furnace charging."

A. H. Fosdick, Superintendent
Blast furnace division
Bethlehem Steel Co., Bethlehem, Pa.

Additional sinter plant capacity already in the building stage includes: The 4000-ton unit for Fairless Works; a new 8-ft machine at Weirton; an 8-ft 3-in. machine for iron recovery at International Nickel's Copper Cliff plant; two additional 6-ft machines at Bethlehem's Sparrows Point plant (that will make four); another major plant for Kaiser's Fontana works; and a host of others still in the talking stage. U. S. Steel is proposing a $25-million plant at Houseville, Pa., and some eight or ten smaller plants scattered throughout its other properties.

"Sintering has always been important in blast furnace operation, but its value is becoming better recognized by steelmakers—especially as a means for handling the fines resulting from the screening of raw material charged into the blast furnace."

C. M. Lichy, Assistant General Manager
Ore mines and quarries
Jones & Laughlin Steel Corp., Pittsburgh

Equipment builders capable of doing the entire job—design through erection—will get the biggest share of the business. Recent mergers and amalgamations bear this out. Koppers Co. acquired the American Ore Reclamation Co.; McDowell Co. Inc. bought the Dwight-Lloyd division of Sintering Machinery Corp.; Dravo has an agreement with Lurgi, and Loftus has a ten-year license with Gutehoffnungshutte, both German equipment builders; and Heyl & Patterson has purchased the patents of an unnamed Cleveland sinter plant designer. Arthur G. McKee has been building the so-called "turn key" sinter plants for a number of years.

THE GARBAGE MEN of the steel industry are shopping for Cadillacs.

That's a quick way of saying that sinter plants, long tolerated as a necessary expense by management and considered "exile" by the men who ran them, are basking in new-found glory. The sinter plant is blossoming under these favorable economic factors:

1. The need for more blast furnace hot metal.
2. The high cost of constructing new blast furnaces.
3. The increasing cost of coking-quality coals.
4. The forced shift to ores containing high percentages of fines.

What Happened?—As late as two years ago some industry leaders could see no real future for the sinter plant. The speed with which the picture changed has them swamped with inquiries and requests for proposals. Activity is at a feverish pace. The four principal and several smaller equipment builders are readying themselves for the day when proposals start turning into orders.

It's no secret that steelmakers have been concerned for some time over the prospect of depleted stocks of direct-smelting ore, and, to a somewhat lesser degree, the dwin-

Economy

dling supplies of coking coals. Some changes in materials or practice seemed inevitable, but everyone had a different idea of what would solve the problem. There didn't seem to be a common solution.

The Answer? — Sintering, the grimy operation that most management men hardly knew existed, seems to be the missing piece in the puzzle—the piece that should help maintain the technological and economic status quo of the steel industry.

To the man who is buying his ore in Venezuela, Labrador or Brazil, sintering will make a highly reducible ore charge out of the screened fines. To the man who is beneficiating Lake Superior taconites or jasper, it's the answer to his agglomerating problem. To the man whose supply of high-grade for open hearth sweetening is depleted, sintering lets him make his own.

What It Means—First off, when a high percentage of sintered ore charge is used in the blast furnace, it can mean up to 20 per cent more output from the same facilities. That's assuming that the other materials are well sized before charging. A five-furnace plant can become a six-furnace operation with sintering and burden preparation.

The coke rate, one of the most important measures of blast furnace efficiency in this period of high-cost coal, is the number of tons consumed for every ton of hot metal produced. While it will be some time before any U. S. plants have sufficient sinter capacity to run their blast furnaces permanently on 100 per cent sinter burden, test results have been encouraging. U. S. Steel's No. 12 furnace at Gary, Ind., ran for nine months on this type charge and the coke rate dropped some 300 lb. At today's costs that saving could amount to $2 to $3 per ton of hot metal.

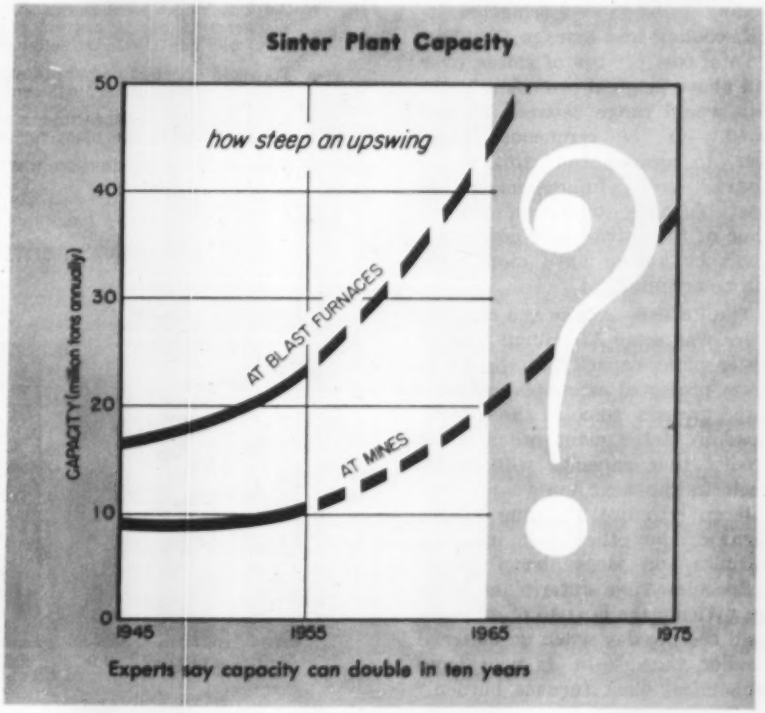
Equally important, the test run showed that the thermal load on the blast furnace was lower. Better gas distribution through the burden enabled a reduction of nearly 30 per cent in air blown into the furnace. Air temperature was increased about 20 per cent. Furnace operators at Gary are convinced even better records can be chalked up as they become more familiar with the practice.

Dollars in the Dust—Sintering is hardly a new art. As a continuous agglomerating process in the iron industry, it got its start in 1911 at E. G. Brooke Iron Co., Birdsboro, Pa., making a useful product out of a large pile of flue dust. At that time, a good many of the iron smelters were seeking ways of utilizing the iron-rich material. A little of it could be charged into the furnace, but not enough to keep ahead of the furnace's ability to produce more.

Briquetting and pelletizing processes were tried, but the continuous sintering idea patented by Messrs. Dwight and Lloyd became the favorite. It involves feeding a prepared mix of various ore fines, flue dust, coke breeze (and occasionally a dash of mill scale or settling tank slimes) onto a slowly moving endless grate. The material is ignited and air is drawn through the bed so that all the volatiles are burned and a clinker-like material is produced.

The "Old Days"—The several sinter plant builders enjoyed brisk business until the early 1940s when flue dust stockpiles began to peter out. Many plants began to import flue dust from other operations and raise the proportion of ore fines in the mix. But sintering remained little more than a clean-up operation.

Kaiser Steel was one of the first to sinter every bit of ore that screened 0 to ¼-in., and the blast furnace records at Fontana, Calif..



have been the envy of many. Lone Star Steel Co. in Texas was another early user of sintered ore. Of course, the upper New York state ores, as well as some of the Birmingham ores, long have been sintered, but as a necessary step in preparation at the mines.

Tailored Properties—The sinter plant of today may look much like its ancestors, but everything else has changed. To begin with, the blast furnace operator will have to show a little more respect for his sinter plant colleague. As time passes, the former will be depending more and more on the latter for the production records his furnace racks up.

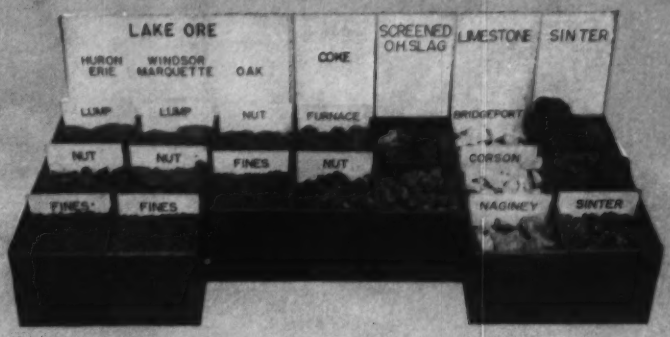
It's no longer a case of whipping up any kind of sinter which is easily digested by the furnace when fed in small doses. When 60, 80 or even 100 per cent of the ore charge is sinter, that product has to combine the optimum in size, physical characteristics and reducibility if the furnace is to operate smoothly and efficiently enough to pay the extra costs, and then some.

What It Costs—A sinter plant capable of an output of 4000 tons a day could run from $5 to $10 million, depending on how much labor-saving materials handling equipment you want. This would include all the materials preparation and feeding units, the sintering line itself, cooling and storage facilities.

Total cost per ton of sinter, over and above original ore costs, probably would range between $1 and $1.40. It is erroneous, however, to assume that this is all "extra" cost. Improvements in blast furnace operation absorb some of the extra—just how much won't be known until more data can be accumulated.

The Future—At the end of 1954, there was some 32 million tons of sinter plant capacity in the U. S. From projected estimates and educated guesses, some of the experts close to sinter plant order books predict that capacity will double itself in the next ten years. Half will go into ore sintering at the furnace, the other half into the taconite and jasper beneficiation.

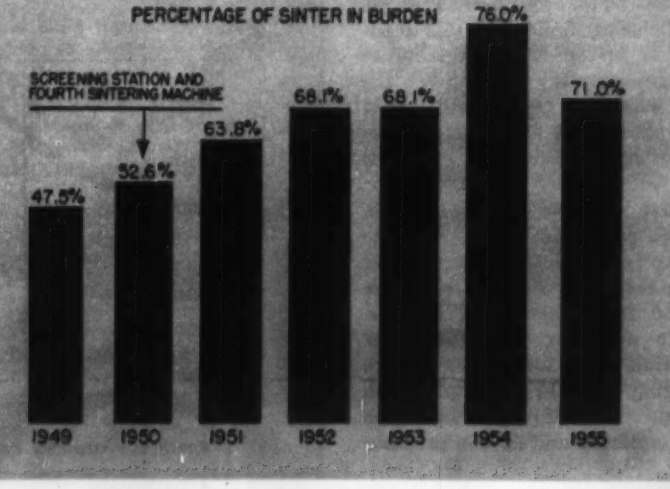
Speculates one sinter plant builder: "Within the next 15 or 20 years we'll see the day when no material smaller than ¼-in. is considered economical blast furnace burden."

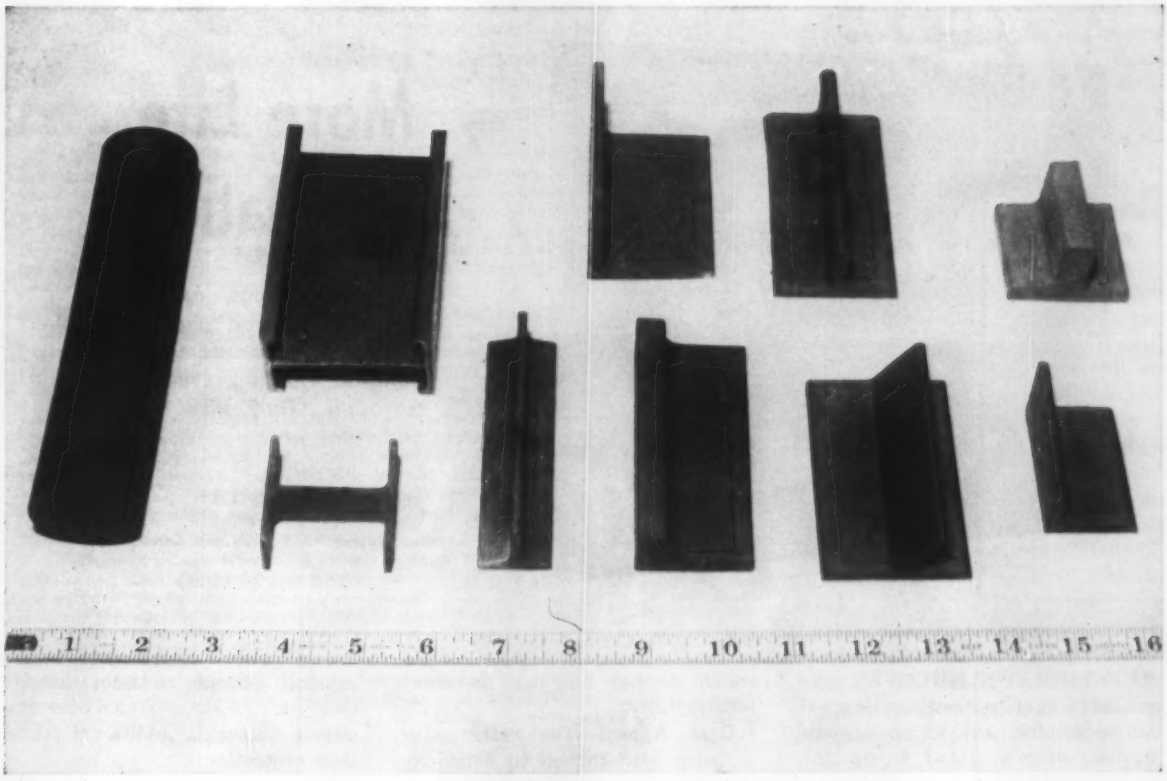


How a Modern Ore Sintering Plant Works

NO ONE in the steel industry has as much sinter plant capacity or the scope of operating experience as does Bethlehem Steel Co. Here are some of the facts on the 2.4-million-ton plant at the Bethlehem, Pa., division:

- Sinter mix (photo above) is a conglomeration of fines from some 14 lake, eastern and foreign ores, plus flue dust, coal and filter cake.
- Sinter plant schedules are set for the year when the year's ore deliveries are scheduled every Apr. 1. Flue dust conditioning and careful planning keep sinter mix constant.
- Every bit of ore is screened to lumps over 1 in., nuts 1 to ⅜-in. and fines below ⅜-in.
- Material from 11 storage bins is belt-conveyed to a pugmill where return sinter fines are added and thorough mixing takes place.
- Sinter mix is fed to the four 6-ft Dwight-Lloyd machines from an angle to minimize packing and increase porosity of the bed.
- About 700 cu ft of blast furnace gas is required to ignite each ton of mix. Temperature at the burners ranges between 2100 and 2200°F. Cost of the gas is about 2 cents per ton of sinter produced.
- Blast furnaces were operating consistently on 70 per cent sinter burden until full operation of all furnaces recently forced a cut to 60 per cent. (Chart below shows sinter used for last six years.)
- To avoid unscheduled shutdowns, one of every 21 shifts works on planned maintenance. All shutdowns are worked out in advance.
- After leaving the machine, sinter is water quenched and 40 minutes later is in the blast furnace.
- Record sinter production was in July—212,452 tons.





These shapes boost the titanium industry and national defense

Titanium Extrusions Ready for Planes

TITANIUM extrusions are in production. Harvey Aluminum, Torrance, Calif., is making them for aircraft structural components.

These alloys are being extruded: 4Al-4Mn, 3Al-5Cr, 9 per cent Mn complex, 6Al-4V and 5Al-2.5Sn. Shapes: Rounds, I-beams, angles, bulb-Tees, heavy-Tees, skew-Tees, heavy angles, H and T-sections.

What It Means — Titanium extrusions give sections with top structural efficiency and versatility in design shape. The low cost of dies invites the production of small lots of special shapes.

The process permits the fabrication of parts that cannot be rolled. Sections are extruded in 10 to 12-ft lengths and meet aircraft specifications.

The high compressive stresses of the extrusion process give high-density metal with good continuity of flow lines and little tendency for sponginess. This means good elongation, high reduction of area and good notch impact strength in traverse directions.

Extruding saves time, labor and material. Savings in expensive titanium are particularly important —chips are difficult to reclaim.

How It's Done—The process for extruding titanium is basically the same as for aluminum. (Extruding pressures are somewhat higher.) A cast billet, heated to the proper temperature (1450 to 1750°F), is placed in a closed container and extruded through a shaped die. The working of the metal is completed in a matter of seconds; contact with the air is limited by the closed container and the short working time.

The oxide coating is much thinner and less significant than the surface oxidation caused by rolling or forging. Extrusions are free of rolled-in scale.

Design of the die keeps material adjacent to the container wall from extruding; the surface of the billet stays in the butt and does not enter the die.

More development work is needed to make more intricate shapes and larger sections. But Harvey's success in making titanium extrusions points the way to wider use of the metal in the aircraft and guided missile industry.

More Life for Plating

Organic coatings, applied over electroplated zinc and chromium, are doing a bang-up job in preventing corrosion. They stick tight and resist wear

By F. L. SCOTT
Manager
Product Application & Evaluation Department
Metal & Thermit Corp.
Carteret, N. J.

REFRIGERATOR SHELVES were probably the first outstanding example of the use of an organic coating over a plated finish. Before World War II, they were protected by a hot dipped tin coating. At the end of the war, tin was not available, and industry had to find a replacement.

First to meet the requirements was zinc plate treated anodically to form a chromate conversion coating, over which was applied a clear organic overcoat. The anodically formed coating gave way shortly to a chemical dip conversion coating which produced a brighter and more attractive finish. It's still used on the large percentage of refrigerator shelves and baskets.

Chrome Plate — Another finish which came into the shelf picture a half dozen years ago was copper-nickel-chromium plate. Here again a clear protective coating was required to produce corrosion protection in recessed areas and at welded joints.

These two finishes have performed so well that there has been no trend back to tin. The industry has repeatedly emphasized that if consideration is again given to tin, a clear organic overcoat certainly will be adopted. This demonstrates how clear enamels over plated surfaces perform a task which neither one can do alone economically.

Cost Appeal—The refrigerator industry also turned to noncorrosive metals, such as stainless steel and anodized aluminum shelving. Both are being used, even though they are more costly than either zinc plate or chromium plate topcoated with a clear enamel.

It would be difficult to predict what type shelf will be in general use in five years. However, higher humidity refrigerator boxes are causing serious consideration to be given to clear organics over aluminum to supply additional corrosion protection.

This is not to imply that the success of zinc or chromium plate for such service is entirely due to the clear overcoat. Just as important are the plate and its treatment before coating.

Antirust—Zinc plate will protect the steel substrate against the formation of rust, provided sufficient thickness is deposited to

Treatment of Chromium Plate To Give Good Organic Adhesion

UNBUFFED PLATE—Chromium plated parts are immersed or sprayed with weak chromic acid. (Solution: 2 to 4 oz of chromic acid to 100 gallons of water. Treatment time: 1 to 2 minutes. Temperature: Between 140 and 160°F.) Deionized or demineralized water should be used. The pH of the solution should definitely be below 6.

After treatment, the parts should be dried quickly either by warm air or a mild oven. Normally, a rinse after the chromic acid treatment is not recommended, but excellent results have been obtained under production conditions where a deionized water rinse has been used. In using this treatment, the following factors bear close checking.

1. Final rinse, if used, must have a pH below 7. Check pH frequently.
2. The surface, when coated, should be dry.
3. Parts should be treated in the dilute chromic acid as soon as possible after plating and coated as soon as possible after the treatment.
4. Handling of the parts after treatment will cause erratic results.

BUFFED CHROME—Plated parts should be cleaned as cathode in alkaline cleaner followed by the dip treatment. The final rinse following the alkaline cleaner before the dip treatment should have a pH below 7. In most cases it is advisable to insert a 5 per cent chromic acid rinse. The dilute chromic acid treatment is then carried out as described above.

Organic Coatings for Plated Surfaces

INDUSTRIAL FINISHES in general are based on alkyd resins, urea, melamine, phenolic, vinyl methacrylate and epoxy resins.

Alkyd resins are the most widely used and are normally fortified (particularly in baking finishes) with either urea or melamine resins to enhance speed of cure, humidity, hardness or mar resistance. In pigmented finishes, they exhibit good exterior durability as exemplified by their use as automotive body enamels. Their excellent color retention is illustrated by their use in white appliance finishes. As clear enamels on plated surfaces, they have excellent water whiteness, good hardness and good humidity resistance. On brass and bronze hardware, where perspiration resistance might be a requisite, they are not suitable.

Phenolics have excellent chemical and solvent resistance but have the disadvantage of relatively poor color (lack of water whiteness). As clear coatings, they are generally limited to the darker metals such as bronze and brass. On these metals their perspiration and sulphide resistance is outstanding.

Vinyl chlorides have excellent humidity, corrosion and chemical resistance. They're used as can linings for beer, beverages and detergents over phenolic, epoxy or oleoresinous primers. They also are widely accepted in the industrial maintenance fields, where they are applied over special primers, such as vinyl butyral and the alkyds. When pigmented, they have good exterior durability, but in clear films they decompose on exterior exposure. One of the clear coatings for refrigerator shelving (referred to earlier) was based on vinyl chloride resins and was selected because of its good resistance to humidity and abrasion

Methacrylates are outstanding for their water whiteness in the clear form and for retention of their whiteness on exterior exposure. They have good humidity resistance, but are definitely unsuited as finishes which require perspiration resistance. In unpigmented finishes, they lack a high degree of hardness and mar resistance.

Epoxy resins have excellent chemical and solvent resistance. Because of their flexibility and impact resistance, they are becoming strong contenders in the container lining field previously held by phenolics. They are widely used as primers for alkyds in the appliance field to enhance corrosion, humidity and soap resistance. Higher baking temperatures than normally employed with other types of finishes are required to develop the full properties of the epoxy finishes.

form a continuous coating, but zinc forms unsightly corrosion products. Organic coatings on zinc plate must prevent the formation of these products under humid conditions, must bond or adhere to the plate so that flaking or peeling does not occur and must have good abrasion resistance to give lasting protection during use.

On chromium plate the organic enamel must prevent the formation of rust, particularly at welds and recessed areas where plate thicknesses are apt to be low, must bond to the chromium plate so that flaking or peeling does not occur and must maintain adhesion to the plate under humid conditions.

On both plated surfaces organic coatings must have excellent clarity and water whiteness and not detract from the bright plate appearance.

Stick Tight—We all recognize that in any type finish, plated or organic, adhesion and retention of adhesion under accelerated test conditions and use are prime requisites. The factors that influence adhesion may be grouped into two broad classifications—physical and chemical.

Physical factors include surface treatment, smoothness or roughness of the metal surface and wetting characteristics of the organic coating. Chemical factors are the polar groupings of the film-forming resins in the organic coating itself. Polarity of the blend of resins and the wetting characteristics of these resins or the coating itself can be controlled by the formulator of the coating.

These, Too—Examine, however, what is generally required in the way of properties of an organic coating aside from adhesion: Water whiteness (if a clear coating), good color retention (either clear or pigmented), good weathering stability, humidity resistance, resistance to corrosion (such as tarnishing in sulphide atmospheres), perspiration resistance on hardware and abrasion resistance.

Generally, such resin film formers have low specific adhesion and low wetting characteristics. The more inert a resin film former, the poorer its specific adhesion and wetting characteristics.

To utilize inert resins, more attention must be paid to the surface on which the coatings are to be applied. Smoothness generally is desired, so surface pretreatment is needed to obtain adhesion with the inert resin film formers.

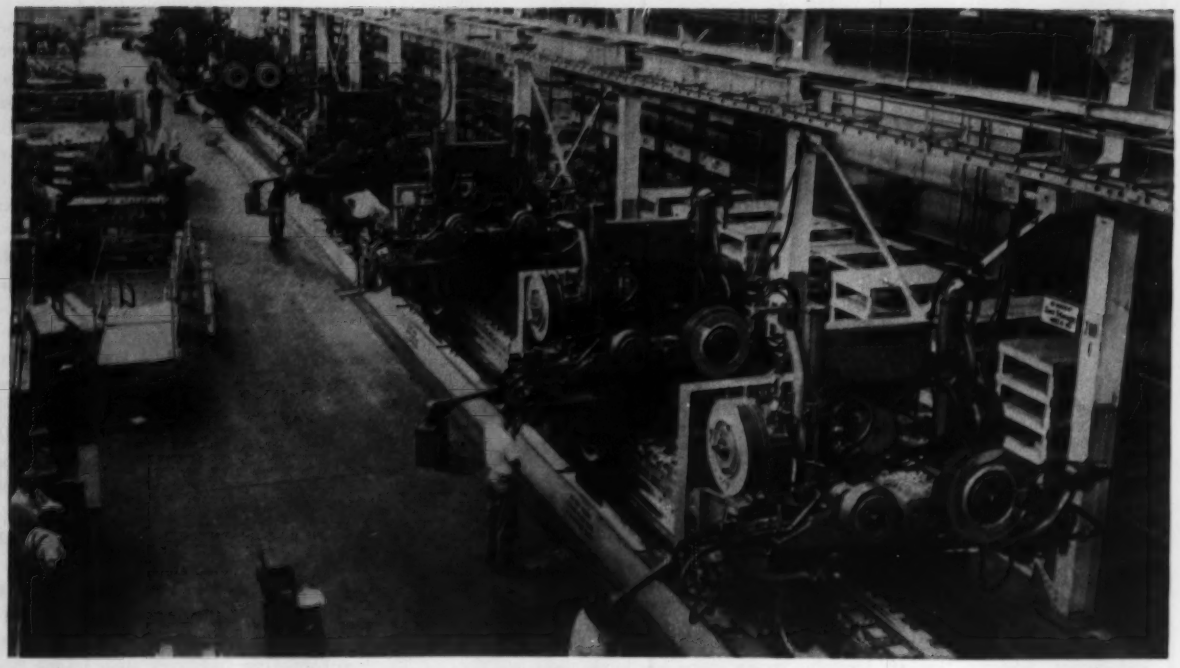
Over Chromium — A good example of the effectiveness of surface treatment in connection with adhesion may be illustrated by the use of organic coatings on chromium plate. Why select this particular surface when the majority of chromium plated surfaces are not overcoated with enamels? First, because chromium plate is about as difficult a metal on which to obtain adhesion as any we know. Second, there are many applications where organic coatings are used on chromium plate.

We've already pointed out one case—the chromium plated refrigerator shelf. A few years ago the automotive industry used clear organic enamels over copper-chromium plate when nickel was restricted. Pigmented enamels are used extensively in the name-plate industry over chromium plated surfaces.

Pretreatment — Good adhesion has been obtained on chromium plate without any special treatment when the organic enamel is applied immediately after plating. Results can be erratic, and the enamel never has good adhesion if the plate has been aged for any time. It has been the experience of those applying enamel over chromium plate that consistent results can only be obtained by the use of a dilute chromic acid treatment—for details, see box.

One caution about zinc plate plus chromate conversion coating, when protected with an organic coating: The leaching treatment used to produce brightness or lack of iridescence of the chromate coating is important. The higher the alkalinity of the leaching treatment, the poorer will be the resistance or the adhesion of the organic enamel. In fact, there is a danger of attempting to produce an overly bright surface by removing the protective chromate film entirely.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.*



Eight carriages on a 308-ft bed make for . . .

Short Work on Long Mill

PICTURE a machine bed as long as a football field; add eight, double-headed milling carriages, and you've got a duplicate of the mill at Douglas Aircraft Co., Torrance, Calif. Not many metalworking plants could put it to use, but the giant is almost priceless to Douglas.

It has opened up a new concept of milling integrally stiffened spars (structural members) for the Skyray and other military jet aircraft.

Here's How — "To attempt to duplicate the work possibilities of this long mill with individual spar mills would have cost more initially and in tooling as well," says C. F. Wallace, the Douglas project engineer who directed tooling.

"Now integral spars are multiple milled on one setup, providing more efficient operation and handling. Work space is kept to a minimum, while a more even flow of work through detailing and processing is assured," he points out.

When multiple operations on a spar are required, two or more carriages can be set at automatic cycle and the various operations performed. Each carriage automatically stops in its predetermined place until other operations are completed. When the last carriage finishes its cycle, all carriages automatically return, with heads retracted, to their starting point.

Operating Flexibility—Each carriage operates individually on the bed, doing its own job in the space required. A number of parts, identical or dissimilar, can be strung end to end on the bed and machined in rapid succession. An overhead crane can pick up any carriage and leapfrog it to any other position on the bed where it can plug into the power supply and be immediately operative.

There are two types of carriages, straight and twist. Both have two, 40-hp, 3600-rpm milling heads designed to stand 100-per-cent overload for 30-minute periods. Mist lubricated and air cooled, the spindle bearings are mounted to stand the thrust of high helix cutters in both directions.

Tracer Controlled—Cutter heads are tracer controlled, vertically and horizontally. The tracer mechanism is hydraulic, with direct rigid feedback.

The templates are of a patented, helical-packaged type. They are composed of developed ⅛-in.-thick aluminum fins permanently mounted on aluminum Tenzaloy drums. The packaged templates, identified by the part number of the piece each will produce, ride on the carriage above the cutter heads. The template drum is geared synchronously to the carriage movement. It rotates with the hydraulic tracer in constant contact with the template.

When not in use, the template package is removed (without disassembly) in 2 or 3 minutes and stored in an adjacent area with the corresponding tooling.

Design Data — The Farnham Mfg. division, Wiesner-Rapp Co. Inc., Buffalo, designed and built this machine. The subbase or

1/3 OFF

NO BARGAIN
FOR UNIFORM FLAT SPRING
PERFORMANCE

According to the deflection formula for flat springs, the deflection or load of flat springs will vary in direct proportion to the third power of the thickness.

This means that flat springs made from .010" ordinary commercial flat rolled high carbon strip (standard gauge tolerance ± .001") can be off as much as 33%, plus or minus, in deflection or load value.

Where the nature of the service calls for more uniform spring performance, CMP produces restricted thickness tolerances which make possible load tolerances of ± 10% or less. CMP is regularly supplying such uniform restricted tolerances for special flat spring applications, multiple-station progressive die forming and other specialized end products where uniform, extra-close gauge accuracy reduces fabricating costs and waste and provides better product performance.

If you have a flat spring problem, you are invited to avail yourself of CMP's specialized knowledge and experience in this field.

CMP
WHERE YOU CAN GET SPECIFIC SPECS. FOR SPECIFIC JOBS

LOW CARBON
HIGH CARBON
Annealed or Tempered
STAINLESS
ALLOY
ELECTRO ZINC COATED

the Cold Metal Products co.
GENERAL OFFICES: YOUNGSTOWN 1, OHIO
PLANTS: YOUNGSTOWN, OHIO AND INDIANAPOLIS, IND.
SALES OFFICES: New York • Cleveland • Detroit • Indianapolis
Chicago • Los Angeles • San Francisco

See us at the METAL SHOW Booth 338 Philadelphia Convention Hall October 17-21

Close-up of a carriage shows five separate template drums for tracer control. They can be quickly changed

Size of the bed can be appreciated in this installation photo. The 4-ft workholding segments are being fixed to the bed

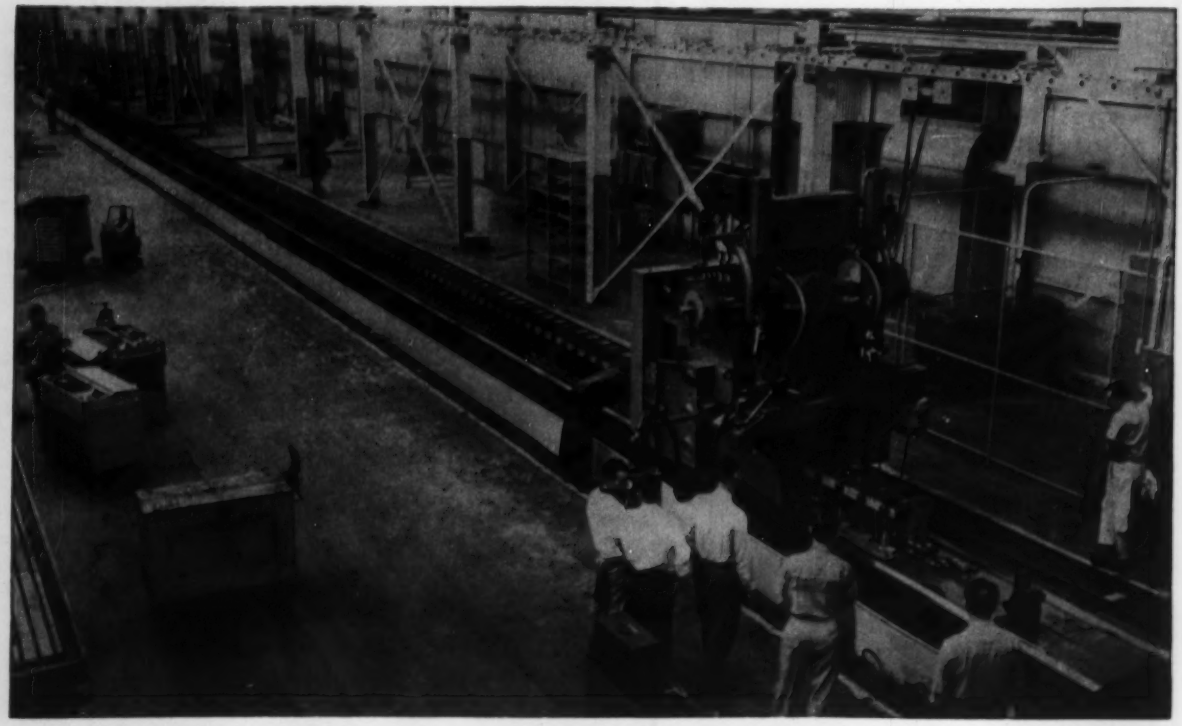
workholder is divided into 4-ft units that carry their own hydraulic valves for clamping action. Interconnected by links as desired, any number of units (in increments of 4 ft) can be actuated with one lever. In addition, each work clamp is valve controlled, so that the carriage itself can trip the valve as it completes each piece.

The Meehanite workholder was designed and fabricated at the Torrance plant. It is 288 ft long and has 72, four-foot sections. After assembly on the bed, the 18-in.-wide surface was machined on assembly to insure parallelism with the ways of the machine.

Setting Up—Any of the eight carriages may be quickly co-ordinated to the part being machined. This is done by moving the carriage so that the centerline of the spindle is directly over the centerline of the cross keyway in the workholder. Then the cam drive is turned by hand until the cams are in zero position.

Once the templates are made and positioned and the work fixed, the complete operational cycle of any carriage is started by pressing one button. There are provisions for manual control and emergency stopping at each carriage.

When all the workholders were installed, one carriage was set up to machine the 18-in. surface to insure parallelism with machine ways



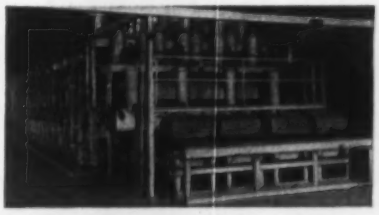
How to Select the Most Economical Insulating Firebrick

The advantages of lightweight insulating firebrick over ordinary "heavyweight" firebrick are generally known to furnace operators and furnace builders. But many buyers have wondered just what advantages there might be in one brand of insulating firebrick as against another. The answer to this question could very well mean savings in fuel costs, increased furnace output, longer life . . . or all three.

One furnace builder ran tests on their small electric kilns where heat input could be measured with great accuracy. Here's what they found: B&W IFB required 25% less heat than any other brand of insulating firebrick they tried.

The reason? B&W IFB are lighter in weight than any other insulating firebrick — they contain more tiny, insulating air cells. Heavier, denser insulating firebrick linings waste fuel two ways: They soak up and store more heat which is lost when the furnace is cooled; and they conduct more heat through the walls.

How about long life? One of the

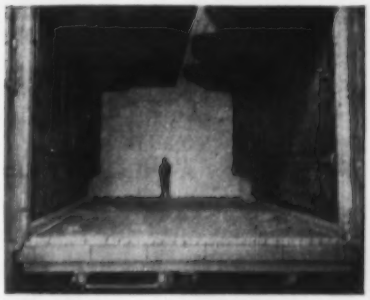


toughest tests of firebrick is in the lining of a carbon monoxide furnace. Some brands last only a few weeks, then disintegrate, due to iron oxide impurities in the brick which react with the gas.

But B&W Insulating Firebrick contain little iron oxide, and they're processed at high temperatures so that any traces of iron oxide form stable compounds. So instead of deteriorating they stay on the job year after year —in many cases over 10 years.

Another factor, important to many furnace operators, is accurate temperature control. Here again B&W IFB have an advantage over other insulating firebrick. First, because B&W IFB are lighter in weight they store and conduct less heat—and they respond more quickly to changes in heat input.

A typical example is the giant stress-relieving furnace shown below—sixty feet by twenty-two feet by seventeen feet high. The B&W lining plays a vital part in holding the desired temperature within 5 degrees accuracy!



Next time you buy or specify insulating firebrick, remember that the lightest weight brick of all—B&W—has the highest insulation value, the longest life and the greatest furnace heat controllability.

THE BABCOCK & WILCOX CO.
Refractories Division
General Offices:
161 East 42nd St., New York 17, N. Y.
Works: Augusta, Ga.

(Advertisement)

8-91B

HEAT TREATING

METALS

METAL FINISHING

Your's for the looking!

The one place in metalworking where you'll find the answers to what's
NEW . . . IMPROVED . . . COST-CUTTING . . . PRODUCTION BOOSTING!

National Metal Exposition *and* Congress...

CONVENTION HALLS
PHILADELPHIA, PA.

OCTOBER 17 thru 21 1955

400-Plus Exhibits

The great names in American industry . . . displaying new and improved products . . . processes . . . services!

Over 100 Technical Sessions!

Top interest sessions will help you do a better job of producing more at lowered costs!

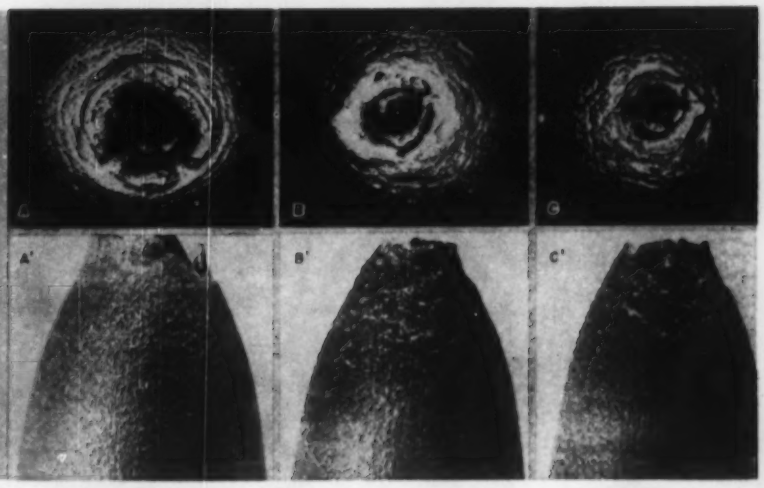
● Industry's concentration of knowledge and experience in metalworking . . . will be on parade for you and your management, engineering, production and purchasing associates to see at Philadelphia Metal Show! Whatever your needs . . . from metals engineering to metal finishing . . . from design to testing and inspection . . . you'll find the quick, sure answers at the technical sessions of the Metal Congress . . . at the operating exhibits of the Metal Exposition. Don't miss it!

OWNED AND MANAGED BY THE AMERICAN SOCIETY FOR METALS
7301 EUCLID AVE., CLEVELAND 3, OHIO
PUBLISHERS OF: Metal Progress, Metals Review, Metals Handbook, Transactions

Effect of temperature on appearance of nickel fractured in creep studies at the National Bureau of Standards

A 300°F No surface cracking
B 700°F No surface cracking
C 900°F Numerous surface cracks

Each specimen shows ductile fracture, a rim effect and circumferential and longitudinal flow lines.



Closer Look at Nickel Creep

ALL METALS CREEP, but theory has yet to catch up with the process. The interrelation of strain hardening, recovery and recrystallization in creep are not fully understood.

Because of the need for precise data on the creep of metals and alloys under carefully controlled conditions, the National Bureau of Standards undertook a long-range research program in this field.

Nickel — The Bureau recently completed a study of the creep characteristics of high-purity nickel. (Previous phases of the NBS program have dealt with high-purity copper, high-purity aluminum and ingot iron.) The results on nickel are of particular interest because of the relatively low temperature at which creep occurs in this metal, and its wide use in jet engines, heating elements and other high-temperature applications.

The investigation dealt with creep in tension of annealed specimens of high-purity nickel under constant load at 300, 700, 900 and 1200°F. The influence of rate of loading and the effect of strain history on tensile properties at room temperature were evaluated.

Three Stages—Creep ordinarily takes place in three stages, which follow the initial extension when the load is applied. The first stage is one of decreasing rate of extension. In the second stage, creep proceeds at a nearly constant rate. The third stage is one of increasing rate, culminating in complete fracture.

Flow was discontinuous in each of the three stages of creep at the temperatures investigated. The discontinuities showed up as serrations in curves of extension versus time and creep rate.

The magnitude and frequency of these serrations were affected by such factors as temperature, stress, strain aging, strain hardening, recovery, recrystallization, grain orientation, grain rotation, formation of subgrains and grain growth.

Stage One—At 300°F nickel had a high resistance to creep at all stresses up to 45,500 psi. However, with further increase in stress of only 500 psi, the secondary creep rate increased by a factor of about 100,000. Strain aging was especially prominent at 300°F.

The experimental values of primary creep agreed fairly closely with the results predicted by the theory of exhaustion and generation of dislocations, but creep rate in the secondary and tertiary stages could not be predicted accurately.

Stage Two — Logarithmic plots of creep rate versus time were nearly linear in the initial portion of the first stage of creep. However, nonlinear relations were generally obtained between stress and secondary creep rate. The prior strain history of the nickel had a marked effect on the secondary creep rate. The Bureau's experimental results emphasize the importance of controlling the rate of loading in creep testing.

Stage Three—The initiation of this stage has been attributed to such factors as the beginning of microcracking, increase in creep stress due to a decrease in the area of the specimen and atomic rearrangement.

In all specimens tested at 300, 700 and 900°F, internal disintegration was confined to the region of complete fracture, and the fractures were preceded by appreciable necking.

Recrystallization, sometimes accompanied by grain growth, occurred in specimens fractured in creep at 1200°F. However, no evidence of recrystallization was detected in specimens fractured at the lower temperatures. The fractures appeared to be predominately transcrystalline at 300, 700 or 900°F and intercrystalline at 1200°F.

Research-Cottrell Precipitator

- Open Hearths
- Iron Ore Sintering Machines
- Ferro-Manganese Blast Furnaces
- Scarfing Machines

Take a look inside the horizontal flow precipitator on the next page. This is the type of Cottrell used for cleaning gases coming from open hearths, iron ore sintering machines, ferro manganese blast furnaces, as well as scarfing machines and electric furnaces.

Although it differs in design from the Research-Cottrell blast furnace precipitator, this Cottrell has the same basic advantages: handles any volume of gas at any collection efficiency up to almost 100%. Maintenance and power costs are low, draft loss is only a few tenths of an inch of water and the precipitator is designed and constructed for many years of heavy duty, all-weather service.

In addition to these major advantages, a few more design features are shown in the cutaway drawing on the next page.

1 Rapping puffs prevented by automatic and continuous cleaning of collecting electrodes with Magnetic Impulse Rapper (patents pending).

2 Plumb-bob discharge electrodes are individually weighted and positioned by a steadying frame for maximum efficiency.

3 Hopper baffle prevents gas snookage around electrodes.

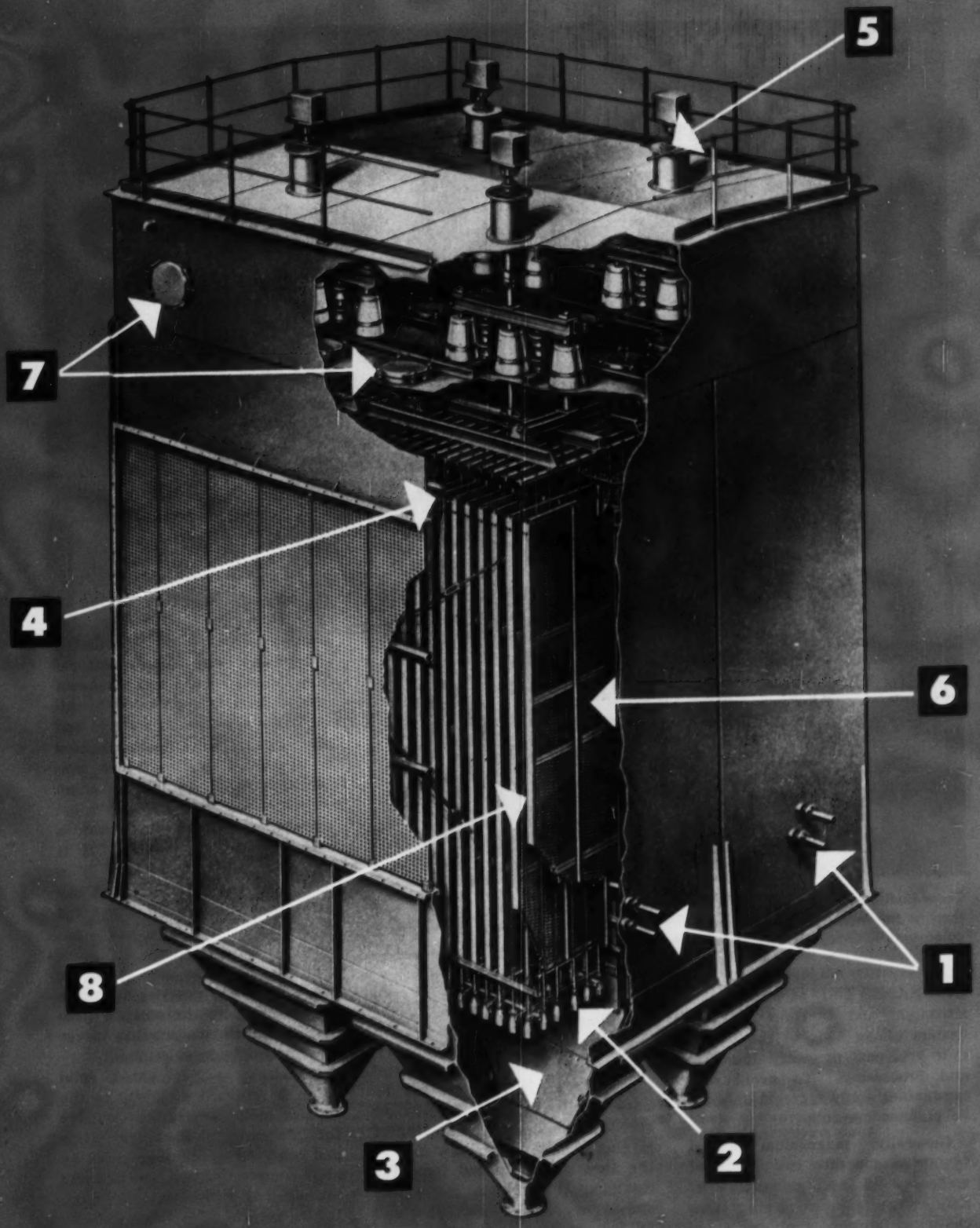
4 Hook-type collecting electrode hangers, quickly installed, insure uniform distribution of rapper vibration throughout entire collecting surface.

5 Continuous, automatic discharge electrode rapping insures optimum performance.

6 No moving parts in gas stream —minimizes maintenance.

7 Easy access to high tension equipment.

8 End and intermediate baffles provide quiescent zones and prevent re-entrainment of collected dust.



Research-Cottrell, Inc.

A Wholly Owned Subsidiary of Research Corporation

Main Office and Plant: Bound Brook, N. J. • 405 Lexington Ave., New York 17, N. Y. • Grant Building, Pittsburgh 19, Pa.

228 N. La Salle St., Chicago 1, Ill. • 111 Sutter Bldg., San Francisco 4, Cal.

RC-159

System Averts Scrap Snarl

HK31 magnesium alloy (containing thorium and zirconium) is charged into 550-lb crucibles for melting. Alloys containing aluminum and zinc, used more, are remelted in 2000-lb tilting furnaces

These gondolas are wheeled to trimming machines where riggings are removed, then to the storage area for unloading. Each gondola has a distinguishing color and lettering to designate alloy it should hold

INCREASED USE of rare earths, zirconium and thorium in magnesium alloys adds to the foundry's problems of scrap handling and processing. To avoid contamination, scrap segregation must be planned carefully.

Generally, magnesium sand foundries generate two kinds of scrap — solid and miscellaneous. Solid scrap includes rigging from castings (sprues, runners, gates and risers) and the scrap castings which are eliminated in inspection. Miscellaneous scrap is generated from processing and includes spillage, run-out metal, runner cup skins, shavings and chips, sawdust and filings.

Segregation—At the Bay City, Mich., plant of the Dow Chemical Co., solid scrap is separated by alloy composition so it can be speedily remelted. The sorting of rigging is done by the saw men at the time it is removed from the castings. Pieces like risers and sprues are sorted by lathe and milling machine operators.

Magnesium scrap which is to be melted must be free of dirt, sand and other contamination. Dirt is removed by sandblasting. Castings, with rigging still attached, are sandblasted before sawing or machining.

Miscellaneous scrap is collected in gondolas (skid bins on casters) from the pouring and shakeout areas. This is segregated by alloy, when possible. Shavings and chips generally are not segregated by specific alloy, but those containing rare earths and zirconium are kept separate.

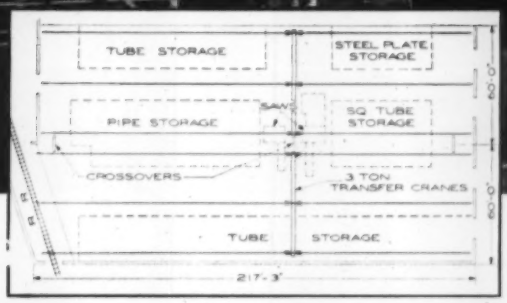
Storage — Magnesium scrap is used as soon as possible. If it must be stored, it is kept in a clean, dry area. If the metal has been stored outside, it is checked and, if necessary, dried and sandblasted before melting.

Shavings, chips and turnings are collected in covered drums in the areas where the scrap is generated. Such material is never placed in outside storage.

Remelting — Segregated, solid scrap is returned promptly to the regular melt area in the foundry for processing. Shavings, chips and other scrap not segregated by alloy composition are remelted and processed in a "reclamation" area. It is returned to the foundry where it is reprocessed and poured into castings.

Grinding sludge and unusable material are burned. This is done with proper safety precautions in a special area.

TRAMRAIL TRANSFER CRANES *SYSTEMATIZE* HANDLING IN STEEL WAREHOUSE



The large storage area is completely covered by Tramrail crane service. Every item can be seen from the floor and readily reached with the two transfer cranes.

The Tramrail transfer cranes make it easy to place the long unwieldly pipes and bar stock into storage at any height. This makes for orderliness, which is an important factor in securing high operating efficiency.

THE BIG modern warehouse of J. M. Tull Metal & Supply Co., Atlanta, Georgia, was designed to make use of overhead Tramrail equipment to enable the handling of large unit loads in and out of storage with the least effort and in the quickest time.

The principal storage section is provided with two parallel runways each having three tracks. On both runways is a 64-foot transfer crane that travels the length of the room. Cross-overs are provided, enabling a hoist carrier transferring from one crane to the other. This makes it possible to haul materials between any two points in the entire area without rehandling.

Steel is constantly on the move in this active plant. From 60,000 to 70,000 lbs. are brought in by railroad car daily and like amounts are shipped out. The material is unloaded from railroad cars at one end of the building and placed into storage. It is shipped out on trucks which are loaded at the other end.

The overhead crane system makes it possible to place incoming materials into allotted storage spaces at once. The need of storing temporarily in aisleways or other areas and extra handling which this entails is eliminated. Thus, the warehouse is kept orderly at all times and every item is readily seen and conveniently reached. Danger of handling accidents is minimized and overall efficiency is unusually high.

GET THIS BOOK!
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

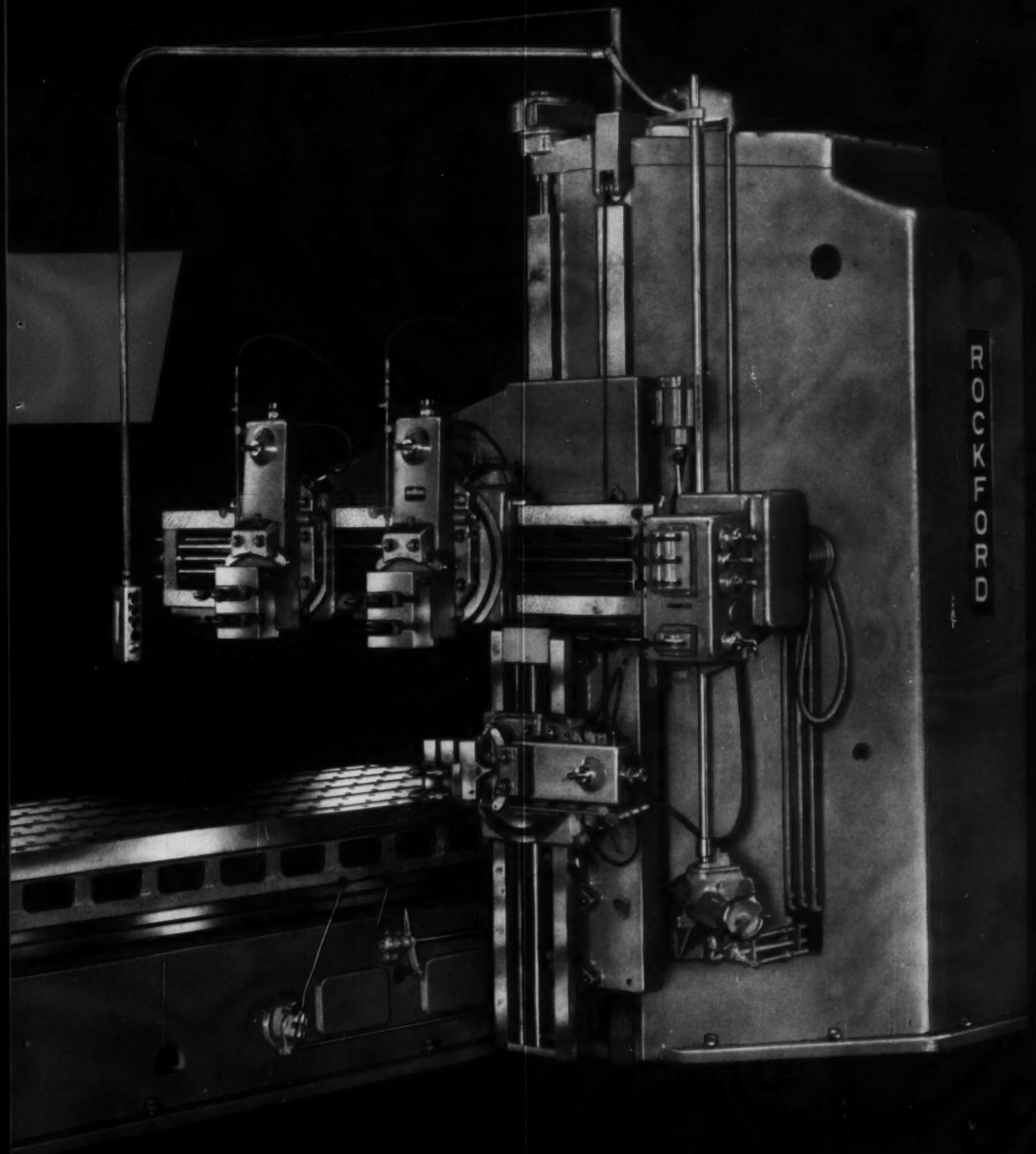
CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7881 EAST 284th STREET, WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

hydraulic

power and speed

The big line of modern Rockford Hydraulic Planers has everything it takes for finer, faster, lower-cost planing. With the exclusive new Triple Circuit, and push-button controls, cutting speeds and forces are now instantly available to most economically machine every type of metal—from free cutting materials to the toughest steels. For the complete story on how to obtain greater profits in modern planing with the unique production advantages of Rockford Hydraulic Planers . . . ask a Rockford Machine Tool Co. representative . . . or write us direct.

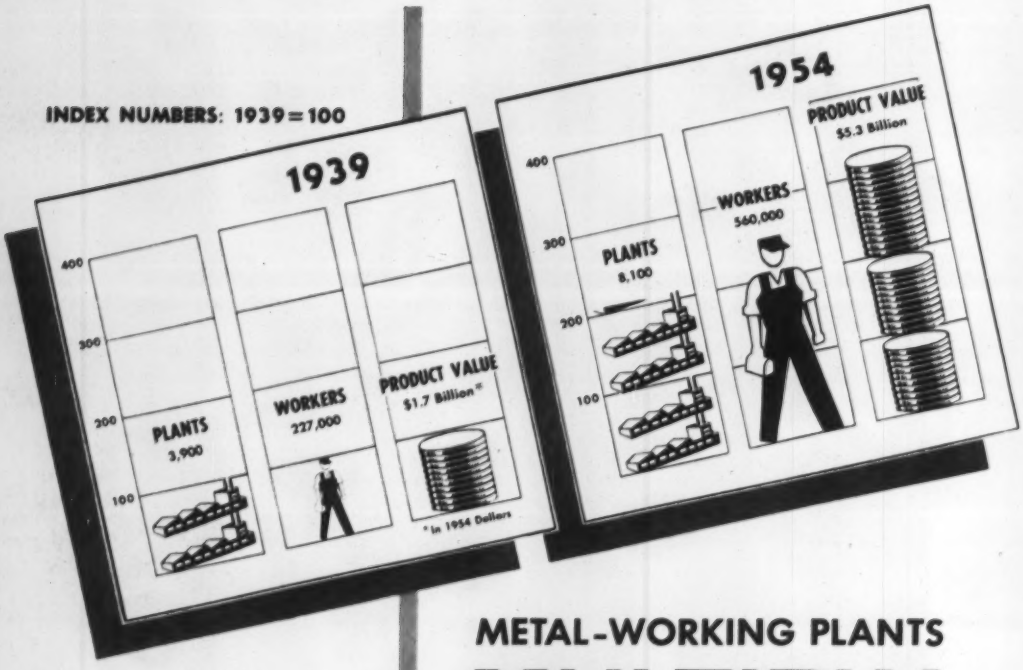


Hy-Draulic

Reg. U.S. Pat. Off.

ROCKFORD MACHINE TOOL CO.

2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS



METAL-WORKING PLANTS

MULTIPLY

IN NEW YORK STATE

New York State has more metal-working plants than any other state, and over the years they keep multiplying. In the past fifteen years, the State's metal-working establishments have more than doubled in number, while the value of their products (in constant dollars) *has more than tripled!* At the same time, workers in these industries have increased 140 per cent.

More industries . . . and a greater variety of industries . . . operate at a profit in New York State than in any other. This is true of thousands of metal-working plants. It can be true of yours.

Our Industrial Location Service is prepared to give you facts — professionally analyzed for your particular benefit — covering sites, raw materials, transportation, labor and power. Our booklet — "Industrial Location Services" — explains what we do and how you can use our knowledge. For your free copy write New York State Department of Commerce, Albany 7, New York.

SUCCESS BEGETS SUCCESS

NEW YORK STATE

Averell Harriman
Governor

Edward T. Dickinson
Commissioner of Commerce

Palletized loads of engine block castings are stacked to ceiling limits

Finished parts for the assembly line are stored in wire pallet boxes

Unit Loads Cut Handling Time

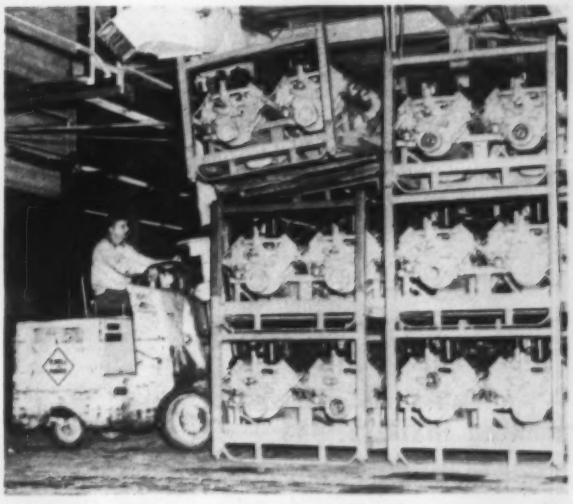
NEARLY 85 per cent of all incoming shipments at the Utica, Mich., plant of Studebaker-Packard Corp. are palletized or in pallet-based containers.

That's because the company specifies that, where possible, its vendors ship either in containers or as load units. Parts received loose are placed in wire baskets for easy handling by fork trucks.

Results—This practice adds up to fast, effortless handling of parts by Elwell-Parker electric fork trucks. It guarantees maximum use of available storage space; load units are stacked to ceiling limits.

Carrying its vendor program of palletization one step farther, Studebaker-Packard ships its engines and transmissions from the Utica plant to the Conner body assembly plant in special racks.

This system provides high-efficiency handling of a large volume and wide variety of parts, plus what are normally considered heavy and awkward finished components.

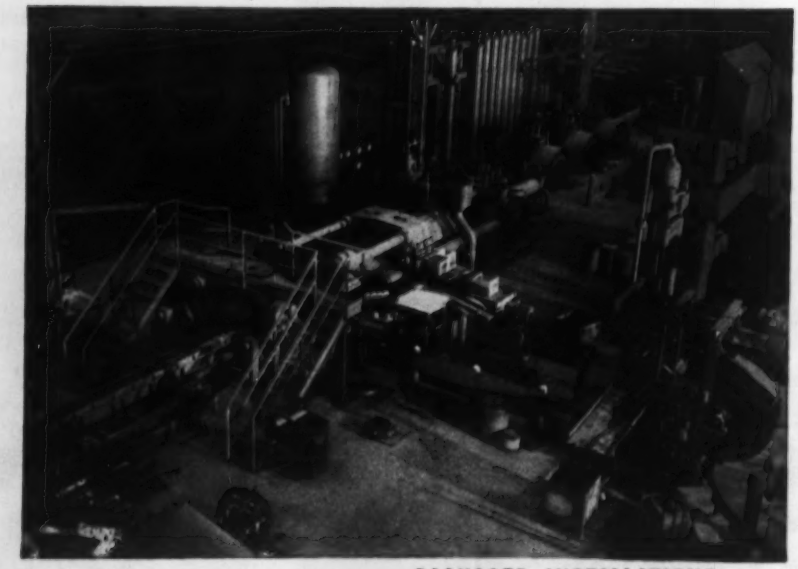


Stacked four to a rack, engines are delivered to storage before shipment

Fork truck loads a double rack of transmissions into an outgoing truck

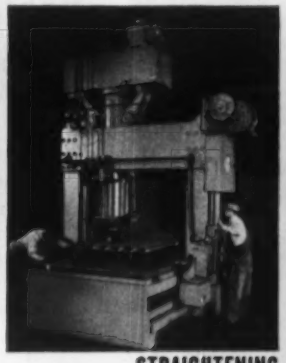
DRAWING

From a single press to a packaged installation . . .



PACKAGED INSTALLATIONS

RUBBER PAD FORMING

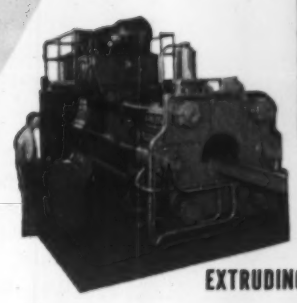


STRAIGHTENING

FORMING

PLATE BENDING

BULLDOZING



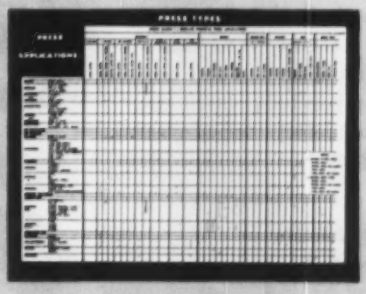
EXTRUDING

LAKE ERIE MAKES THEM ALL

More than 3,500 developed designs of hydraulic presses to meet every pressing requirement are immediately available to you at Lake Erie. Make it a practice to consult Lake Erie about your hydraulic press needs.

(Leasing and deferred payment plans tailored to your exact needs.)

SEND FOR HANDY BUYER'S GUIDE ▶



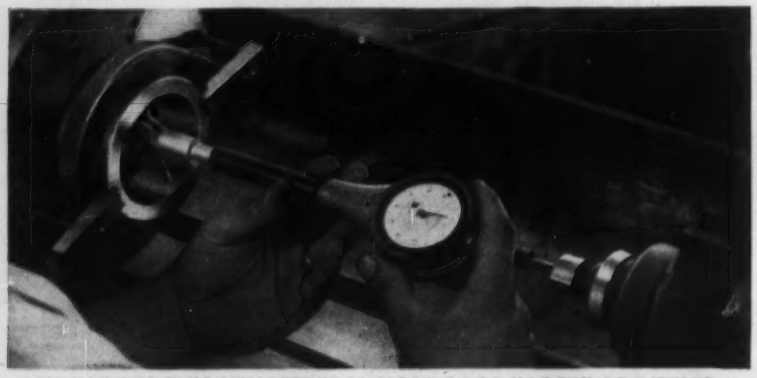
LAKE ERIE HYDRAULIC PRESSES

EXTRUSION PRESSES • DIE CASTING MACHINES
ROLLING MILL AUXILIARY EQUIPMENT

LAKE ERIE ENGINEERING CORP. *General Offices and Plant: 882 Woodward Ave., Buffalo 17, N. Y.*
District Offices in New York, Chicago, Detroit, Pittsburgh
Representatives in Other U. S. Cities and Foreign Countries

LAKE ERIE®

A GAGE'S PRICE IS THE SMALLEST PART OF ITS TOTAL COST!
The cost of a gage is its price *plus* cost of gaging time *plus* costs of rework and scrap that appear in spite of the gage's use. For example: our booklet "A Management Blind Spot" reports how a $10.00 plug gage made in a toolroom actually cost $3800 a year. The $165 Federal dial indicating bore gage that replaced it cost only $825 a year.



WHY DOES THIS NEW FEDERAL HOLE GAGE "COST" SO LITTLE?
It reduces rework and scrap because operators *see* every diameter accurately magnified (*not* approximately). Compared with other dial-indicating gages, it prevents more off-size work from getting by. Its extreme sensitivity detects minor deviations from specified tolerances which other gages do not even show up. It can do the work of more costly air gages except in only a few rare cases. No wonder it "costs" so little!

COMPARE "HIDDEN COSTS" OF GAGES BEFORE YOU BUY!
It pays to look at all the facts behind a gage's price tag. Our free booklet, "A Management Blind Spot" shows you how to tell the difference between gage price and cost. Write for your copy today. Better still, why not have a Federal gage engineer give you specific gage recommendations?

FEDERAL PRODUCTS CORPORATION
Dept. 16H Providence 1, R. I.

Ask **FEDERAL**
FOR MODERN GAGES AND GAGING TECHNIQUES . . .
Dial Indicating, Air, Electric, or Electronic — for inspecting, measuring, sorting, or automation gaging

Beefed-Up Hammer

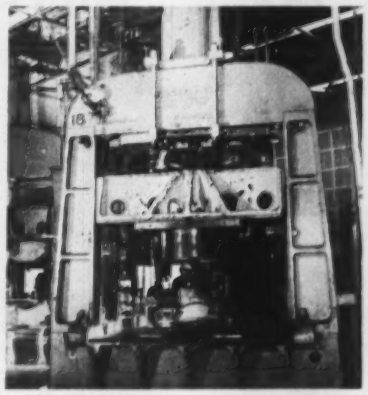
It bangs out small aircraft parts with 9000-psi blows, twice its normal force

ENGINEERS at Boeing Airplane Co. defied a hammer manufacturer's warning when they altered a Chambersburg Cecostamp to pound out parts at 9000 psi. The hammer didn't break.

In operation nearly five months, it turns out perfect parts with flange lengths 50 per cent greater than those formed in a hydropress. It can form metal as hot as 1000° F.

Double Pressure—A Cecostamp hammer is forced down by compressed air above a piston. Normally, compressed air also is below the piston, so the operator can adjust the two pressures to apply a light tap or a heavy blow —up to 4500 lb.

Boeing engineers devised a locking mechanism to hold the hammer at the top of its stroke. While it is held, air is sucked out of the cylinder below the piston and forced into the top. When the locking device is released, the hammer comes down with double the force its builder intended.

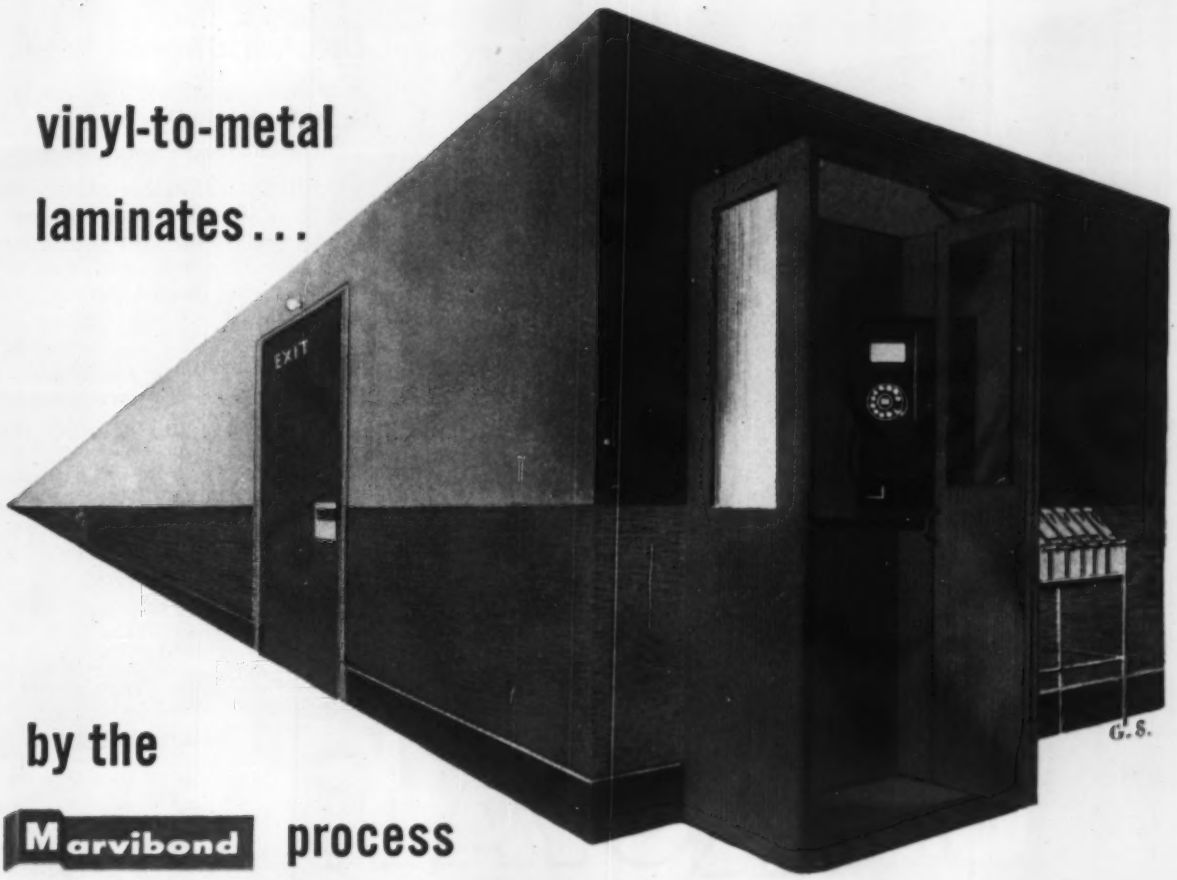


CECOSTAMP HAMMER
. . . what is its capacity?

Rubber Padded — A matching head ring and anvil were built. A disc of hard rubber fits inside the ring, leaving a space of about 3 in. at the bottom into which the anvil fits. A second hard-rubber disc is laid on the top of the die to get additional pressure.

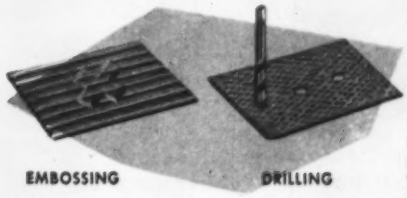
Boeing is thinking about upping hammer pressure to 14,000 psi.

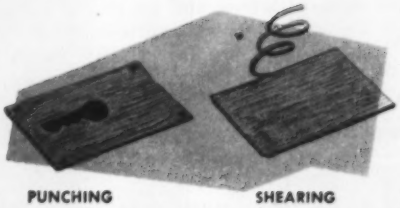
vinyl-to-metal laminates...

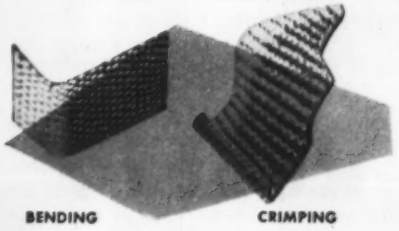


by the Marvibond process

for beauty and practicality in a building material







The Clad-Rex Steel Co.† produces vinyl-to-metal laminates by the Marvibond process.

Scuff-proof and rust-proof vinyls are being permanently united with steel and aluminum, by Clad-Rex, at a rate of 4,000 sq. ft. an hour. And Naugatuck's Marvibond process makes this possible... the bonding of specially formulated vinyl film or sheet to most metals on a continuous production basis.

The Marvibond* process permanently weds the vinyl to the metal *before the product is formed*...eliminating expensive finishing operations. Marvibonded vinyl-metal laminates can't be separated by bending, crimping, drilling, embossing, punching, or drawing...can be formed with standard metal working tools.

Practically any surface effect can be achieved! Smooth or matte finishes, leather-like grains, marble patterns, prints, weaves, and sculptured appearances are not only possible but *economical*. And Marvibonded vinyls will not chip, crack or craze...are far superior to paints, lacquers, varnishes, phenolic and alkyd finishes.

Why not consider the advantages that Marvibonded laminates can add to your products? This exceptional material has a great future in wall paneling, vending and business machines, office furniture and automobile interiors... in fact, *wherever* sheet metal is used.

For samples and technical information, write to us on your company letterhead, TODAY.

†Denver, Colorado

*Patent applied for

Naugatuck Chemical

Division of United States Rubber Company
Naugatuck, Connecticut

US RUBBER

BRANCHES: Akron • Boston • Charlotte • Chicago • Los Angeles • Memphis • New York • Philadelphia
IN CANADA: Naugatuck Chemicals, Elmira, Ontario • Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices • Cable Address: Rubexport, N.Y.

The sheet fabricating material that turns designers' dreams into Practical Realities

Is the case, cabinet, cover or other part of your product now made of a material which leaves something to be desired in...

ECONOMY? Royalite economy entails low initial tooling costs and exact, inexpensive prototypes. Tooling may be of wood, resin or metal, depending on the production run. *It's both faster and lower in cost.*

BEAUTY? Royalite's beauty of integral colors, grained or smooth, makes *a more sales-appealing product, eliminates all finishing costs*... another economy.

STRENGTH? Royalite's exclusive compounding of thermoplastic fortified with rubber gives *unequalled wearability and impact resistance.* It may be both *rigid* and tough or *flexible* and tough, as required.

DETAIL? Royalite molds readily to *sharp detail and contour,* giving latitude to the designer.

WORKABILITY? Royalite may be sawed, machined, drilled; bolted, riveted or swedged to metal and other materials.

Economy? Beauty? Strength? Detail? Workability? Only Royalite has them all. Write, wire or phone for full information. United States Rubber Company, 2638 N. Pulaski Road, Chicago 39, Ill.

US RUBBER **United States Rubber**

New Magnetic Coils

Made of anodized aluminum, they can replace wire-wound coils in many applications

ELECTROMAGNETIC COILS for transformers, solenoids, some motors and generators are being wound from strips of aluminum foil or thin aluminum sheet.

Anodic coatings, 0.0002-in. thick, serve as insulation between the windings, replacing the paper, glass or enamel insulation normally used with wire coils.

Compact—Aluminum coils can be used with no increase in equipment size. Spiral winding of the coils subjects the conductor insulation to turn voltage only; normal layer insulation can be eliminated. This saving in space, coupled with that derived from the use of thin anodic films for insulation and the lack of voids in the completed windings, accounts for the compactness.

ALUMINUM COILS
. . . big one is for 10-kva transformer

The coils can be operated at high temperatures and have good heat dissipation features. The anodic coating of aluminum oxide —a chemically inert material—reduces the possibility of a coil burning out since the melting point of the coating is higher than that of aluminum.

Lightweight—In most cases the weight of the coil is about one-half that of a comparable copper unit.

The method of winding the coils was developed by Reynolds Metals Co., Louisville. The company also is using more conventional insulating materials, such as polyester film in the new aluminum coils. These coils offer similar advantages in many applications.

Norgren
Spray-Lube *System*
as applied by Square D Co.

to multiple tapping operation, speeds production 30%

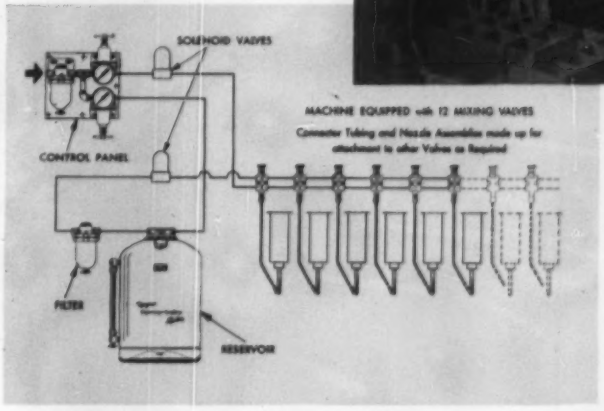
and in addition:

eliminates time and labor formerly required for draining and wiping tapped parts

relieves one man for more productive work

elimination of flood system greatly improves working conditions

substantial saving in lubricant


SOLENOID VALVES
MACHINE EQUIPPED with 12 MIXING VALVES
Connector Tubing and Nozzle Assemblies made up for attachment to other Valves as Required
CONTROL PANEL
FILTER
RESERVOIR

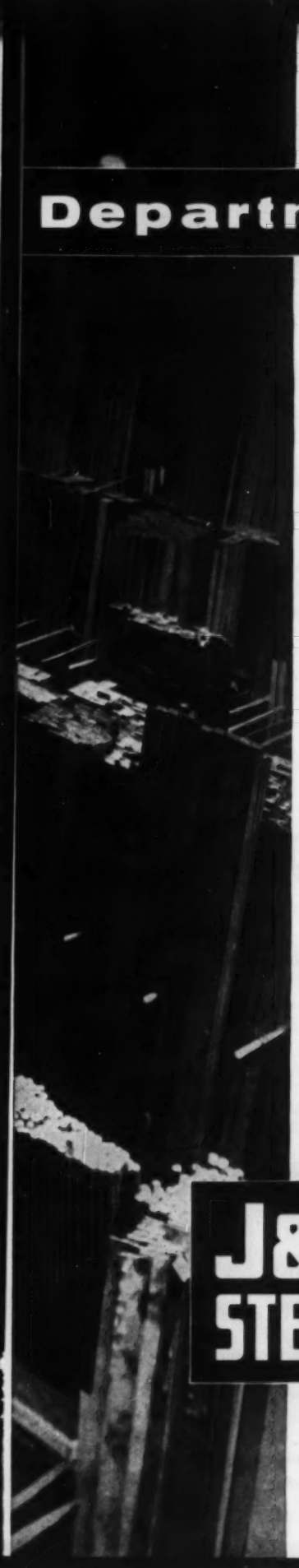
This tapping machine in the Square D Company production line handles a wide variety of tapping operations requiring as many as 12 taps in simultaneous operation. On job shown, tapping 3 holes in each of 2 switchbox covers, Norgren Spray-Lube System increased production 30% . . . eliminated the cleaning process. Even greater increases were reported on other jobs.

The unpleasant and hazardous disadvantages of the previous flood system, splashing lubricant over the operator and the surrounding floor, has been eliminated by Spray-Lube. Lubricant saving (Stanicut No. 107) has been substantial. Solenoid valves permit the Spray-Lube System to be actuated only when taps are approaching and contacting the work.

C. A. Norgren CO.
3412 So. Elati, Englewood, Colo.

For complete data on this Norgren Spray-Lube application write for Blueprint SL 5 or phone the Norgren representative listed in your telephone directory classified section under Norgren Pneumatic Products.

the



JONES & LAUGHLIN

Department Store of STEEL

IN

Chicago
Cincinnati
Cleveland
Detroit
Hammond
Indianapolis
Lancaster
Louisville
Memphis
Nashville
New Orleans
New York
Pittsburgh

Warehousing . . . you can have as much . . . or as little steel as you need on a moment's notice from the complete stocks of your J&L Steel Warehouse.

Processing . . . lower your handling costs by using the shearing, forming, torch cutting, blanking, metal sawing and other processing facilities of your J&L Steel Warehouse.

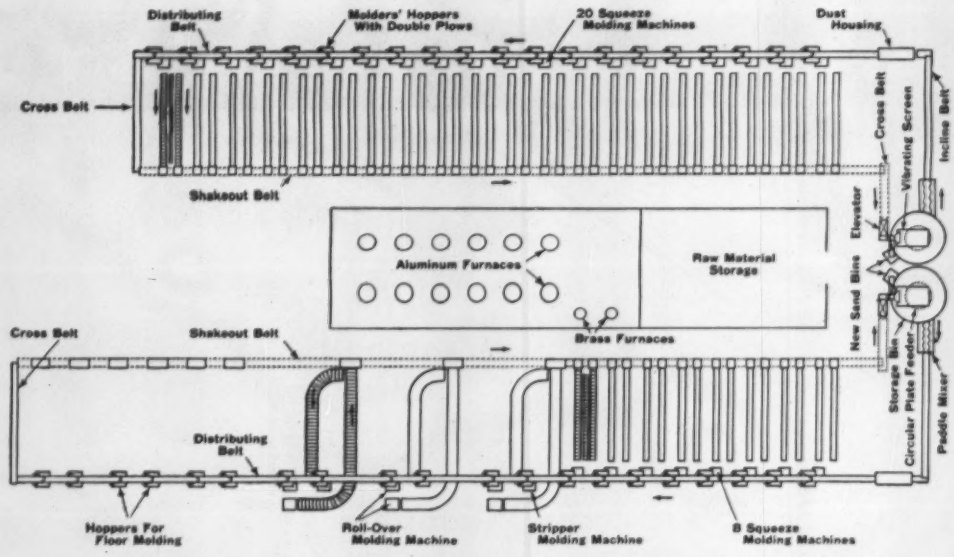
Prompt Delivery . . . recover valuable factory floor space by getting the steel you want . . . when you want it from your J&L Steel Warehouse.

J&L STEEL

JONES & LAUGHLIN STEEL WAREHOUSE DIVISION

JONES & LAUGHLIN STEEL CORPORATION

DIVISION OFFICES INDIANAPOLIS 7, INDIANA



New aluminum foundry has 2 mechanized sand handling systems, 28 squeezer molding stations, 6 large rollover and stripper stations

Room to Swing a Molding Line

HERE'S A GOOD WAY to boost production in an aluminum foundry where job runs are short (from 100 to 1000 pieces) and patterns are changed several times daily.

Crouse-Hinds Co., Syracuse, N. Y., did it with a new, 48,000 sq ft foundry equipped with two completely mechanized sand handling systems. The company makes electrical equipment that requires cast aluminum housings. By the end of this year, the new plant is expected to lift output of aluminum castings 40 to 50 per cent.

More Room—Aluminum and iron foundries were housed in one building. Lack of working space limited both operations. Grinding and cleaning rooms were jammed, piles of sand obstructed molding machines and molds for nonferrous castings were set and poured by hand and hoist.

With the new foundry, floor space for all casting is 149,832 sq ft. The area once occupied by the aluminum foundry has been added to the molding and core departments of the iron foundry.

Belt and Melt — Casting operations in the new aluminum foundry are centered on two similar Link-Belt sand conveyor systems, each running lengthwise along the sides of the plant. Together, they deliver 70 tons of prepared molding sand an hour to 28 squeezer molding stations and six large rollover and stripper stations.

Between the systems is a central melting area, shielded on four sides by an aluminum apron extending from the roof down to within 8 ft of the floor. Fans in the roof above the melting area exhaust gas fumes and hot air at 90,000 cfm. An intake system simultaneously replaces, heats, filters and humidifies an equal amount of fresh air.

Three Gains—Several production efficiencies have resulted from the centralized furnace area: 1. Furnace fumes are more easily exhausted. 2. Gas furnaces are fed from one underground manifold. 3. Molten aluminum is carried only short distances, which minimizes accumulation of surface oxides.

To increase floor space, columns have been kept to a minimum by suspending sand hoppers, overhead sand conveyors and footwalks from the roof trusses.

Serving the Molders — All 20 squeezer molders on one side of the foundry and eight identical machines on the other handle small molds. These eight stations share sand with three combination rollover and stripper molding machines and three units which are equipped with overhead cranes for handling and closing large molds.

Each squeezer station is flanked by three lines of gravity conveyors, slightly elevated at opposite ends

Long view of foundry. Each squeezer station is flanked by three gravity conveyors, which are elevated at opposite ends to allow easy movement of molds, bottom boards and bands

to allow molds, bottom boards and bands to roll easily. Roller conveyors near the rollover and stripper machines also are used for handling drags, setting cores and closing molds. Molds are placed on these conveyors for pouring, cooling and transfer to shake-out boxes.

Back for Re-Use — From this point, shake-out sand removal for both sides of the foundry is handled identically by the two systems. An underfloor belt collects and carries used sand from the shake-out boxes of each molding station to duplicate preparation units at the back of the foundry. These units include crossbelts with magnetic pulleys for removing ferrous scrap, bucket elevators, vibrating screens and 100-ton storage bins.

After cooling, castings that vary from 6-in., thin-section lamp guards to 40-in. traffic signal controller housings are packed into tote trucks for transfer to the grinding room.

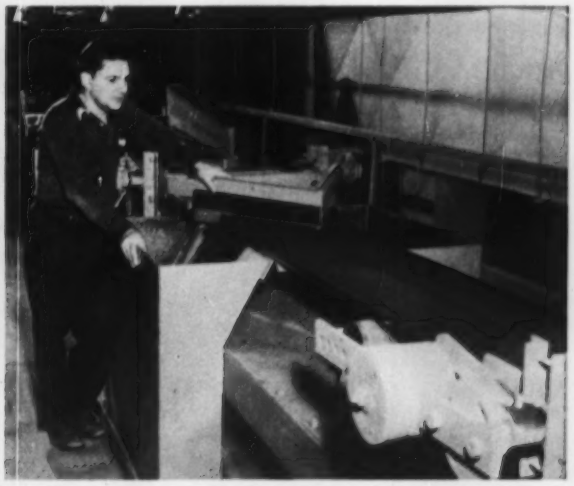
Sand System—Sand, withdrawn from the storage bins by plate feeders, is spilled into the paddle mixers where moisture is added. Reconditioned for molding, the sand passes by belt conveyors to aerators which discharge it onto two belts. These belts carry the sand the length of each side of the foundry to molders' hoppers.

To refill a particular hopper, counterweight plates, operated by sand already in the hopper, automatically raise or lower a plow on the feed belt. When lowered, the plow forces sand off the belt into the hopper; when raised, it allows the sand to continue traveling forward to the next hopper or beyond to the end of the distribution line. Any sand reaching the final crossbelt is carried back to the shake-out belt, forming a closed circuit.

Clean and Safe—The foundry is kept dust-free by a wet-type exhaust duct system which removes dust from the shake-out spill belts, elevators, sand storage bins and vibrating screens.

A single panelboard controls all electric motors in the sand handling system. The motors also are interlocked to shut off automatically if one motor fails. This control prevents sand from piling on the shake-out belts, shake-out screen or apron conveyor.

Between sand handling systems is furnace area, shielded on four sides by a large aluminum apron. Fans in roof exhaust gas fumes and hot air at 90,000 cfm



To refill hopper, counterweight plates, operated by sand already in hopper, automatically raise or lower a plow on the feed belt

NOW IS THE TIME . . .

and here is the way!

To Reduce Manufacturing Costs with a . . .

SEVENTY FIFTH BULLARD ANNIVERSARY

CUT MASTER

VERTICAL TURRET LATHE

This revolutionary new design of vertical turret lathe has exclusive features never before offered on machines of this type . . . takes full advantage of the latest improvements in cutting tools and methods . . . truly the machine with a "built-in" future.

. . . Model 75

AVAILABLE IN 26, 36, 46, 56, 66, AND 76 INCH SIZES

PENDANT CONTROL . . .

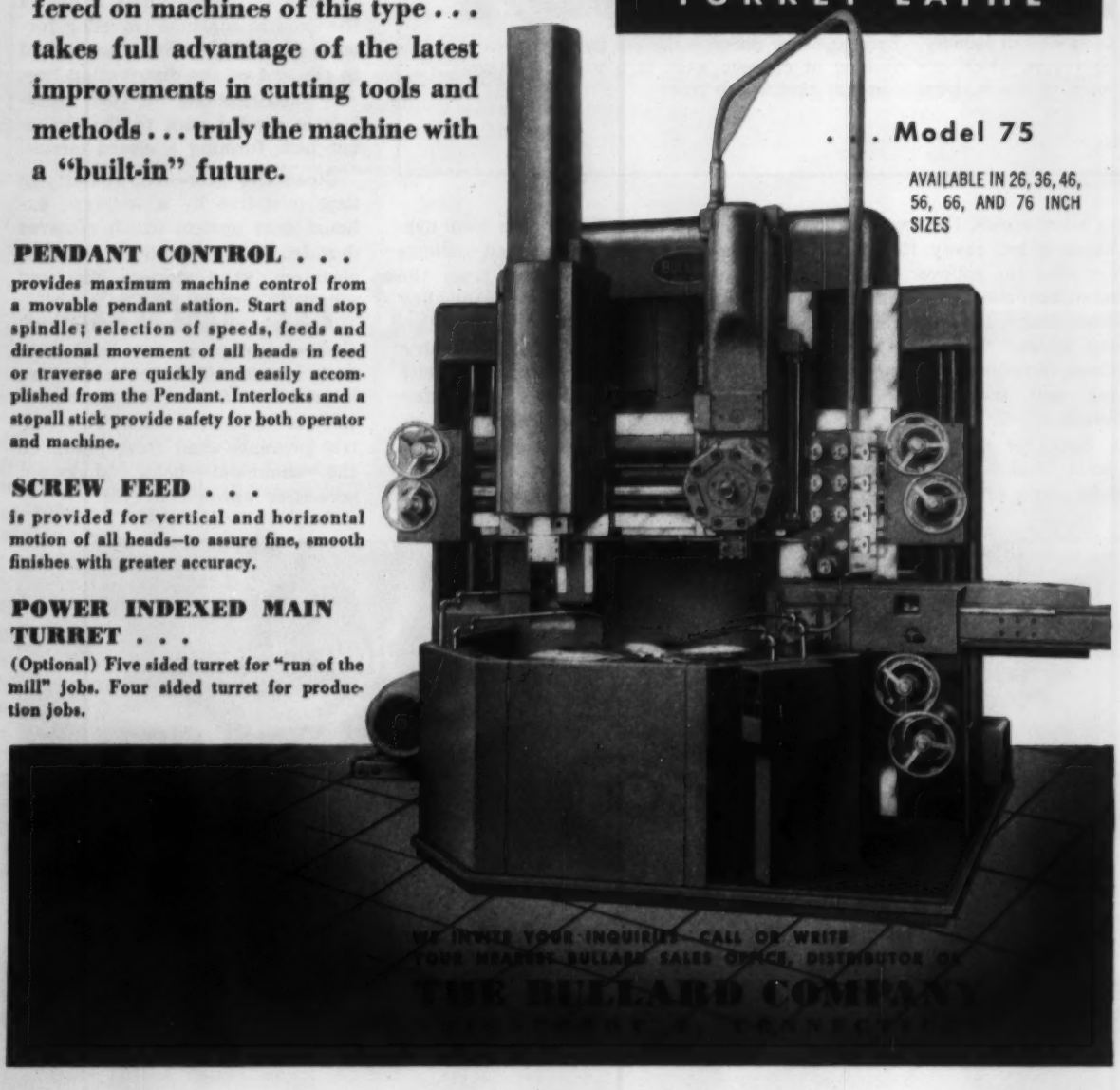
provides maximum machine control from a movable pendant station. Start and stop spindle; selection of speeds, feeds and directional movement of all heads in feed or traverse are quickly and easily accomplished from the Pendant. Interlocks and a stopall stick provide safety for both operator and machine.

SCREW FEED . . .

is provided for vertical and horizontal motion of all heads—to assure fine, smooth finishes with greater accuracy.

POWER INDEXED MAIN TURRET . . .

(Optional) Five sided turret for "run of the mill" jobs. Four sided turret for production jobs.



WE INVITE YOUR INQUIRIES—CALL OR WRITE YOUR NEAREST BULLARD SALES OFFICE, DISTRIBUTOR OR

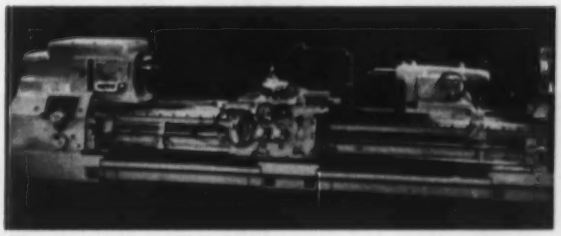
THE BULLARD COMPANY

75-HP Engine Lathe Makes Heavy Cuts

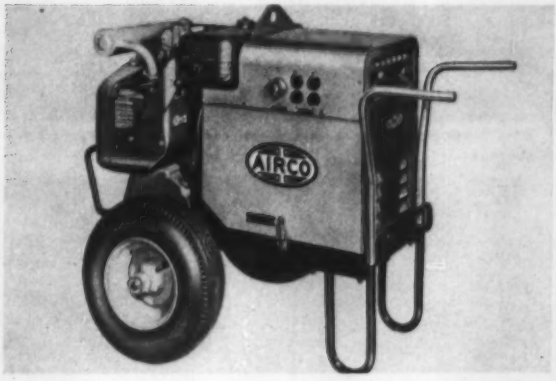
Stamina, rigidity, precision, ease of operation and operator safety are embodied in this new 32-in. lathe.

Direct driving gears are combined with spindle speeds of from 6 to 750 rpm. Selection of 30 thread or 81 cutting feeds is made by a lever and a dial positioner.

A horsepower indicator aids selection of feeds and speeds for maximum motor output. *Write*: Axelson Mfg. Co. Division, U. S. Industries Inc., P.O. Box 58335, Vernon Station, Los Angeles 58, Calif. *Phone*: Ludlow 7-1271



Arc Welder Features Weatherproof Construction



Two engine-driven alternating current welders, models GEA200 and GEA200L, are suited for field and maintenance work.

Rated welding current is 200 amp, 100 cycle, single phase, with a 100 per cent duty cycle. Welding current range is 15 to 200 amp; open circuit voltage is 85 volts.

The high frequency of the welding current makes the welding arc stable. Electrodes from 1/16 to 3/16-in. in diam are used.

Both models provide 1-kw, 110-volt, d-c auxiliary power. Model GEA200L also can supply 4.5-kw, 110 to 220-volt, 60-cycle, single-phase alternating-current power. *Write*: Air Reduction Sales Co., Division of Air Reduction Co. Inc., 60 E. 42nd St., New York 17. N. Y. *Phone*: Murray Hill 2-6700

Surface Grinder Profiles Shapes from Line Drawings

This optical contour grinder with a hydraulic tracer control is coupled with a 30-in. screen comparator.

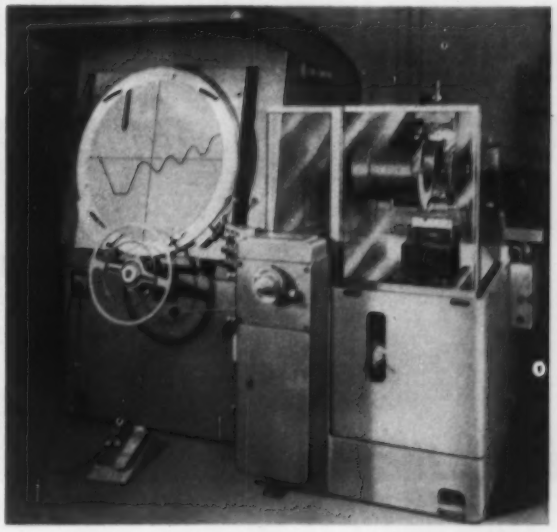
The screen is arranged for visual and manual control of the grinding wheel from a contour chart.

An outline chart showing the enlarged contour of the workpiece is mounted on the comparator screen. An equally enlarged image, representing the cross-sectional form of the grinding wheel cutting edge, is projected on the screen.

Convenient controls permit the operator to advance the grinding wheel along the work contour. The projected image, representing the cutting edge, is simply made to follow the outline chart on the screen.

Quick changing lens systems give 5, 10, and 20-power magnification. The optical system is completely protected from the grinding area; coolant may be used on the grinding wheel.

Length and rate of travel of the oscillating worktable are adjustable. A large diameter (10-in. minimum, 14-in. maximum) grinding wheel is used. Im-



AIM for reduced handling

Unitized and strapped sheets of veneer being placed in storage by mechanical lift.

Bulky flue liners are handled easily when unitized into this strapped package.

Pressed wood chip logs unitized and strapped in jig for faster handling.

Steel strapping has unitized this package of brick for removal by lift truck.

KD cleated boxes are quickly and easily strapped into units for faster and safer handling.

costs with Acme Steel Strapping and unitizing ideas

Truck transmissions unitized to cut shipping, material costs and speed handling.

KD cartons unitized on pallet for easy handling and safe shipping.

Unitizing—the process of grouping and strapping individual packages or products into a single unit—is paying off for manufacturers in virtually every industry.

The pictures tell the story of what Acme Steel *unitizing* ideas can accomplish, as brought to industry by your *Acme Idea Man:

- . . . Faster handling
- . . . Savings in packaging materials
- . . . More effective use of warehouse space
- . . . Better product protection—safe delivery

Talk to your *Acme Idea Man. Let him show you how to apply Acme Steel Strapping, Strapping Tools and *ideas* to your packing, handling, storage or shipping problems. Just call the nearest Acme Steel office, or use the coupon below.

ask your *Acme Idea Man to help solve your problems

ACME STEEL PRODUCTS DIVISION
ACME STEEL COMPANY
2840 Archer Avenue, Chicago 8, Illinois

ACME STEEL

Get this new UNITIZING BOOK showing industrial unitizing ideas made possible by the use of Acme Steel Strapping. Fill out coupon on the right.

Acme Steel Products Division, Dept. GH-95
ACME STEEL COMPANY
2840 Archer Avenue, Chicago, Illinois

Please send me the new ☐ Acme Steel Unitizing Book. ☐ I am also interested in having an Acme Idea Man call on me.

Name_____ Title_____

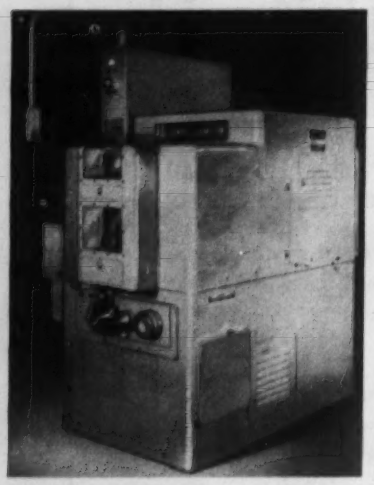
Company_____

Address_____

City_____ Zone_____ State_____

portant machine components are precision controlled on preloader slides.

Tap Grinder—Automatic work handling brings high production to this new machine. A wide range of work speeds meet grinding conditions on all tap sizes up to ⅝ in. in diameter.



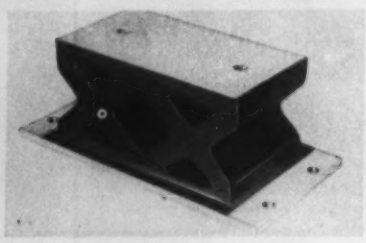
Multiple cuts can be made. Grinding cycles are held constant; rapid wheel advance, depths of cut and rapid withdrawal are positively controlled through a simple cam action.

Another new tool insures proper alignment between spindle and tool holders on small turret lathes and single spindle automatics. *Write*: Jones & Lamson Machine Co., Springfield, Vt.

Vibration Resistors

Here are bonded-rubber lattice mountings that isolate vibration and noise, particularly in the low-frequency, high-amplitude range. Capacities range from 250 to 3000 lb; static deflection from ¼ to 1½-in.

Mountings have a latticed rubber section which is bonded to horizontal steel plates at top and bottom. The shock load is carried by the rubber in shear.



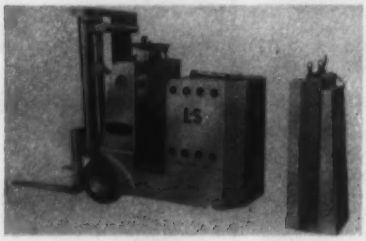
Uses include mountings on vibrating screens and conveyors, foundry shakeouts, generators and air conditioning compressors. *Write*: Lord Mfg. Co., 1635 W. 12th St., Erie, Pa. *Phone*: 2-2296

Round Lead Anodes

These anodes for chromium plating come in standard, medium, heavy and super R sizes. They are made of virgin lead and tin specially alloyed for use in all chrome solutions. The design improves current distribution and speeds up plating. *Write*: Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland 11, O. *Phone*: Academy 1-6560

Electric Fork Truck

A removable counterweight gives this lift truck two capacities. When the 1325-lb counterweight is installed, it has a capacity of 4000 lb; when it is removed, capacity is 2000 lb.



A stand, which can be lagged to the floor, can be furnished to hold the counterweight. To remove the weight, the truck is backed against the stand and two bolts are loosened. The weight drops in the stand and is held in place with a chain. *Write*: Lewis-Shepard Products Inc., Watertown, Mass. *Phone*: 4-5400

Lightweight Magnet

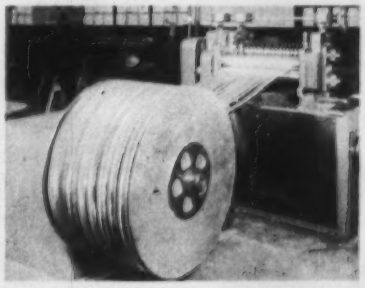
Use of strap aluminum in this lifting magnet (55 in. in diameter) saves weight. Designed for scrapyard boom cranes and handling lightweight (windblown) scrap, it weighs 5200 lb.

An 8 to 10 per cent increase in net tonnage handled is possible because of faster maneuverability, more trips a day and the ability

to lower the boom to cover a large radius without moving the crane. *Write*: Electric Controller & Mfg. Co., 4500 Lee Rd., Cleveland, O. *Phone*: Ludlow 1-1800

Rotary Gang Slitter

Production is 18,000 lb of coiled strips every eight hours. The slitter has a unit-mounted core plate re-coiler and scrap winder and an expanding drum payoff.



The re-coiler eliminates expensive push-off equipment. Precision tolerances, ± 0.001 in., are given by a re-coiler slip clutch which is adjustable from the operator's position while the machine is running. *Write*: Stanat Mfg. Co. Inc., 47-28 37th St., Long Island City 1, N. Y. *Phone*: Ravenswood 9-2420

Boring Machine

Simplified setup and automatic controls are featured by this precision machine. It will handle work up to 9 in. in diameter and bore to a depth of 6 in.

The headstock has a built-in sine bar for accurate boring and turning of tapers.

Spindle speeds are from 775 to 4000 rpm. The motor is ½-hp.

The machine has automatic and

"With this machine we do a better job . . . faster than ever before"

COLUMBIA STEEL AND SHAFTING COMPANY
CARNEGIE, PA.

Three CONTINENTAL-Medart Centerless Turners like this have now been in service for many months at Columbia Steel and Shafting Company. Here's what they say about them: "These machines have materially improved the operation of our production lines. The finish obtained is of consistently high quality. We particularly like the better manipulation of the bars made possible by more automatic handling. In short, they have fully justified their installation."

Here are the features that put this Model RFRG Centerless Turner in a class by itself for high speed, high quality production: New direct-drive roll feed has patented universal centering device that insures continuous, positive feed and automatically centers work. Separate variable drives for feed and cutterhead maintain precise ratio between bar feed and cutter speeds. Automatic input and output grip carriages permit constant feed and delivery without shut-down. Work is simplified and made easier for the operator by fully automatic push button control at his working position.

The CONTINENTAL-Medart Model RFRG Centerless Turner will turn or rough peel ferrous or non-ferrous bars and tubes up to six inches diameter, at throughput speeds limited *only* by the capacity of the cutting tools. Remember—if your operations call for centerless turning or peeling of bars or tubes from 1" to 10", there is a CONTINENTAL-Medart to do it—faster, better and at lower cost. Write for information.

CONTINENTAL

CONTINENTAL
Foundry & Machine
Company

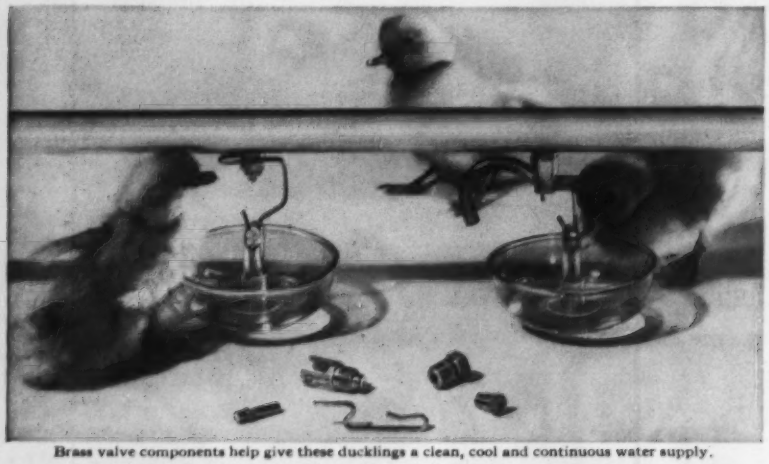
Engineering and Sales Office, 220 Grant St., Pittsburgh 19, Pa.
General Offices, 144 Railroad St., East Chicago, Ind.
Plants at East Chicago, Ind. • Wheeling, W. Va. • Pittsburgh, Pa.
Copes-Vulcan Division, Erie, Pa.

BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

Bridgeport Brass Co.

Reporting new developments in copper-base alloys and metalworking methods.



Brass valve components help give these ducklings a clean, cool and continuous water supply.

Automatic Drinking Fountains for Poultry Use Brass for Dependable Service

A good supply of clean, cool water helps to produce steady chick growth and good eggs, but the problem is to water poultry adequately without spillage, flooding, and, in the case of chicks, drowning.

A solution to this problem is the ingenious automatic drinking fountains made by Drinxall Manufacturing Company of North Hollywood, California.

With parts fabricated from Bridgeport copper-base alloys to Drinxall's own design, these poultry fountains are self-filling and sanitary. Poultry can't get in, nor water out, and chicks do their drinking right in pens, batteries or cages.

Drinking cups are suspended from water-supply lines by valves made from Bridgeport Free-Cutting Brass Rod Alloy 6 and by wire clips of Bridgeport Spring Brass Alloy 37. When water gets low in the plastic cups, a counterweight opens a supply valve until water reaches the proper drinking level, when the counterweight causes the valve to close.

Drinxall also uses Bridgeport copper-base alloys for a fountain using a peck-type valve, the valve opening when poultry peck at the moist valve stem.

The small, yet accurately made parts for the Drinxall valves shown are made from Bridgeport Free-Cutting Brass Rod Alloy 6. A composition of 61% copper and 3.4% lead gives this alloy exceptionally free-machining properties and a uniform composition. The use of Bridgeport Alloy 6 also assures accurate dimensions, essential in close-tolerance parts such as the small Drinxall valves shown above. Bridgeport Free-Cutting Rod Alloy 6 gives manufacturers a fast-production alloy ideal for high-speed, economical machining. Its strength and uniform composition serve close-tolerance requirements and make it particularly suitable for valves. Precision finishing assures efficient functioning, including perfect closing of metal-to-metal valve seats.

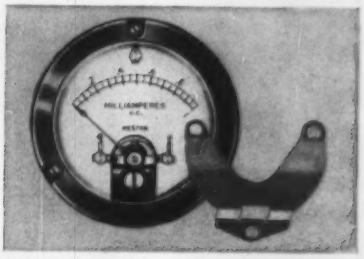
Bridgeport Copper Alloys were selected for Drinxall fountains because of their uniform high inner quality and consistent conformity with specifications covering composition, temper, finish and dimensions.

In thousands of cases such as this one, Bridgeport Technical Service representatives studied the requirements of an application, then recommended materials that have given satisfaction to manufacturers and customers alike.

Bridgeport Technical Service will recommend the alloys best suited to your particular applications, manufacturing methods, and production requirements. Call your local Bridgeport office for this helpful advice.

Magnet Holders Stamped from BRIDGEPORT Nickel Silver Withstand Rugged Use, Meet High Standards

To insure that the ruggedized meters it manufactures are able to withstand hard use, Weston Electrical Instrument Corp., Newark, New Jersey, uses only the sturdiest of materials. In addition, these Weston instruments are tested on machines such as a 2,000 foot-pound shock-testing machine and various vibration-testing machines.



Weston Milli Ammeter Model 1521 uses the Nickel Silver Magnet Retainer inset at right.

A typical Weston part is the magnet retainer (shown above) stamped and formed from Bridgeport Nickel Silver Grade B 555. This alloy has high strength and corrosion resistance, plus good spring properties and high electrical resistance. These properties make Bridgeport Nickel Silver B 555 ideal for telephone boards, radio parts, electrical controls, optical goods, surgical and dental instruments, and diaphragms.

Weston's magnet holder is formed so that its base has a slight buckle which flattens when the holder is fastened to the instrument housing. Permanent spring action of Bridgeport Alloy B 555 secures the magnet holder.

In this application, as in others, the selection of suitable Bridgeport alloys was made after Bridgeport's technical service and laboratory experts studied the metalworking requirements of the manufacturer, then recommended the exact alloy, temper, finish and size—not only to meet specifications, but to assure product quality and sales acceptance.

Bridgeport's helpful services . . . and 90 years of metalworking experience . . . are available to you through the nearest Bridgeport sales representative.

(3970)

Bridgeport Brass Co.

BRIDGEPORT BRASS COMPANY ♦ BRIDGEPORT, CONNECTICUT

Mills at Bridgeport, Conn., Indianapolis, Ind., and Adrian, Mich. Sales Offices in Principal Cities—Conveniently Located Warehouses

NEW PRODUCTS and equipment

manual controls, with timers for repetition of predetermined cycles for cutting, dwell and reverse motion of the table and cross slide. *Write*: Atlantic Instrument Co., 90 Broadway, Norwood, Mass. *Phone*: Norwood 7-2638

Hydraulic Bar Feed

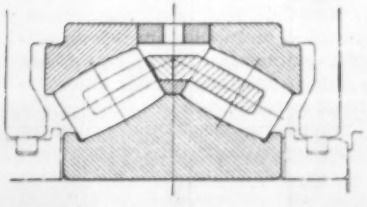
Operated by independent motor drive this unit handles ⅜, ½, ⅝, ¾, 1⅛, 1¼ and 1½-in. diameters.

A new feature returns the piston to the rear of the stock tube. *Write*: Boyar-Schultz Corp., 2001 S. 25th Ave., Broadview, Ill. *Phone*: Fillmore 5-1300

Thrust Bearing

This improved back-up roll bearing will handle the thrust in rolling mills where the radial bearing is not designed to take it.

The new bearing may be lubricated with oil or grease and is interchangeable with bearings used in existing hoods.

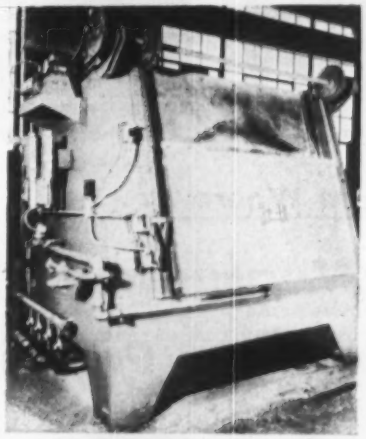


It is a C-type unit with 12-in. bore and 22-in. OD. A life of over 7 million tons of rolled products is indicated. *Write*: SKF Industires Inc., Front St. & Erie Ave., Philadelphia 32, Pa. *Phone*: Garfield 6-6400.

Toolroom Furnaces

A new line of radiant-tube fired, controlled-atmosphere furnaces operates at temperatures up to 2100° F.

Doors are power operated and have a special seal for furnace atmospheres. The burner system overcomes the usual tube roar. A full flame curtain is built into the



door sill. A silicon carbide hearth and high quality insulating refractory linings are standard. *Write*: Bellevue Industrial Furnace Co., 2620 Crane, Detroit 14, Mich. *Phone*: Valley 2-5935

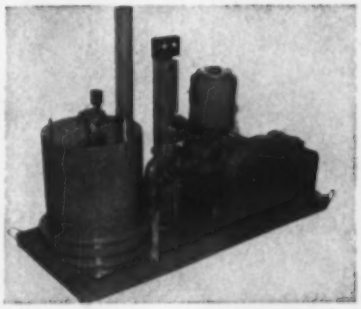
Billet Marker

The operator of the billet marker can be in the control tower with the roll operator or at any other vantage point that will give the best position for spotting the end of bloom, slab or billet to be marked. Only a pilot valve is needed to operate the machine.

A special air-operated positioning unit has a four-way valve. The 6-ft air cylinder provides operating power and enables the stamping machine operator to position the marker in front of a slab or billet quickly. *Write*: M. E. Cunningham Co., 1038 Chateau St., Pittsburgh 33, Pa. *Phone*: Allegheny 1-3280

Degassing Chamber

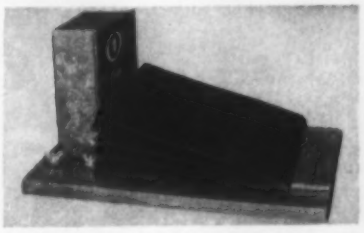
Dissolved gases in molten metals are removed by this high vacuum chamber. It can hold up to 1000 lb of metal in ladles or crucibles. Metals are processed at pressures below 200 microns.



Aluminum can be degassed in 5 to 10 minutes. Physical properties of copper-base alloys and steel are improved. *Write*: Centrifugal Casting Machine Co., P. O. Box 947, Tulsa, Okla. *Phone*: Cherry 2-2816

Magnetic Sheet Floater

This permanent-magnet device separates stacked steel sheets automatically for faster, safer handling. A stainless steel enclosure protects the Alnico magnet block from damage and the demagnetizing influences of stray iron at-



tracted to the back side of the blocks. Sizes range from 7 to 25 in. *Write*: Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 46, Wis. *Phone*: Orchard 2-7830

Pump Motor

Here is a new motor with a face-type registered bracket and special shaft. It's suitable for close-coupled centrifugal pumps. Built to the new NEMA specs, it's compact.

A pump may be mounted flush with the motor by bolting to the

Design—Johnson music wire, to be used in a volume control spring for your television set, is looped through a 180-degree arc and rotated through millions of cycles on this rotating beam fatigue tester (left). The spring designed from this wire is then vibrated 50,000 times through its operating cycle (right). Test results enable Hunter engineers to select the most economical wire and spring design for the purpose.

Wire Must be Uniform Where . . .

Accurate Measurement of Quality Shaves Costs On Precision Springs

Cost saving through exacting accuracy in design and production of precision springs is a specialty at Hunter Spring Company.

Over the past 25 years, its plant at Lansdale, Pa., has become a thought-center in the industry. Today, this center is becoming increasingly important to spring development for radio and television, electrical and gas appliances, automotive equipment, controls and hundreds of other applications.

To build springs with the precision demanded at Hunter requires assurance of a continuing supply of special wire with consistent and uniform high quality.

For this reason, Hunter produces a large share of its springs from specialty fine wire supplied by Johnson Steel and Wire Company. Take music wire, for example. Starting with sizes as small as .003 inch in diameter (about the thickness of a human hair), so fine that one pound contains over seven miles of wire, Hunter's requirements range upward to diameters as large as .150 inch.

In production of more common springs, Hunter often starts with Johnson's oil tempered M.B. high carbon spring wire in diameters ranging from .030 to .080 inch. It supplements this range with sizes from .080. to .500 inch, produced by experts at Johnson's parent Pittsburgh Steel Company.

As a measure of the importance of uniformity in the wire, consider the unique methods and equipment Hunter uses to design springs.

On rotating beam fatigue testers, developed by Hunter engineers, wire samples of predetermined length are looped through an arc and rotated at high speed. Studies of the number of cycles to failure indicate expected wire life in dynamic service. The life of springs made from this wire is compressed into a period of minutes by vibrating the spring through its entire operating cycle at high speed.

Test results of wire fatigue characteristics are correlated with those for the springs made from it. This enables Hunter to design springs for adequate service at minimum cost. Stress data for a complete range of wire and a wide variety of springs give Hunter research engineers an invaluable basic storehouse of information for economical design of springs. Yet, this information would be practically meaningless without dependable uniformity in the wire they are using.

Scientific quality control only begins with spring design, however. It is followed through with thorough inspection during production operations and a unique system for testing finished springs called "statistical quality control."

Hunter production facilities include modern high speed automatic coiling and torsion machines built to turn out precision compression, extension or torsion springs at machine-gun tempo. Special equipment is used to produce springs in a variety of intricate designs.

Secondary operations encompass grinding-of-ends on compression springs, forming-of-ends on tension or torsion springs, heat treating to relieve undesirable residual stresses

(Advertisement)

Production—Compression springs for high-quality locks made from .040-inch diameter Johnson music wire fly from this standard Torrington W-11 coiler at rates up to 5,000 an hour (left). The new Torrington No. 1 torsion machine equipped with multiple slides (right) is producing intricate refrigerator motor mounting torsion springs from .076-inch diameter music wire at rates up to 7,000 an hour. Each spring is precision built to exceed the life of the motor.

after cold working and plating or coating to resist corrosion—all accomplished on efficient up-to-date operating facilities.

To be scientifically sure that all of these factors, from the testing of wire through the design and production of springs, add up to the exact spring required by the customer, Hunter researchers now go to work again. Equipped with a complete line of testing apparatus for checking loads ranging from a few milligrams to 20,000 pounds, they test each shipment by (1) 100 per cent inspection, or (2) scientific sampling.

Delicate load testing equipment, for example, checks the amount of deflection in each spring. The piece-to-piece variation pattern in each shipment is sent to the customer in the form of a "statistical quality report." This report reduces inspection costs at the receiving end, provides a basis for decisions leading to changes in tolerance specifications, and assures the customer of receiving springs built for maximum performance at lowest cost.

Obviously, the success of this entire system is predicated on consistently uniform quality in wire from coil to coil and from shipment to shipment, even though the shipments may arrive at Hunter many months apart. To supply Hunter, Johnson Steel and Wire Company has geared production and testing techniques to meet these quality standards.

Do you use any of these specialty wires: Aircraft Cord, Armature Binding, Belt Hook, Bobby Pin, Brush, Gutterbroom, Card, Heddle, Shaderoller, Flexible Shaft, Hose Reinforcement, Hose, Mandolin, Piano, Rope, Safety Pin, Special Shaped, Staple, Metal Stitching, Signal Corps, Oil Tempered or MB Hard Drawn, Music Spring, or Tire Bead?

If so, why not take advantage of Johnson's long experience and modernized equipment to fill your requirements with quality wire you can depend on for uniformity? A call to our closest district office today will bring prompt attention!

Testing—Here delicate extension springs made from .009-inch diameter Johnson music wire to be used in record playing machines, are load tested. Under an initial tension of 8.44 grams, each spring is permitted a variation tolerance of only 1.23 grams (the weight of two paper clips). The variation pattern is sent to the customer in a statistical quality report.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

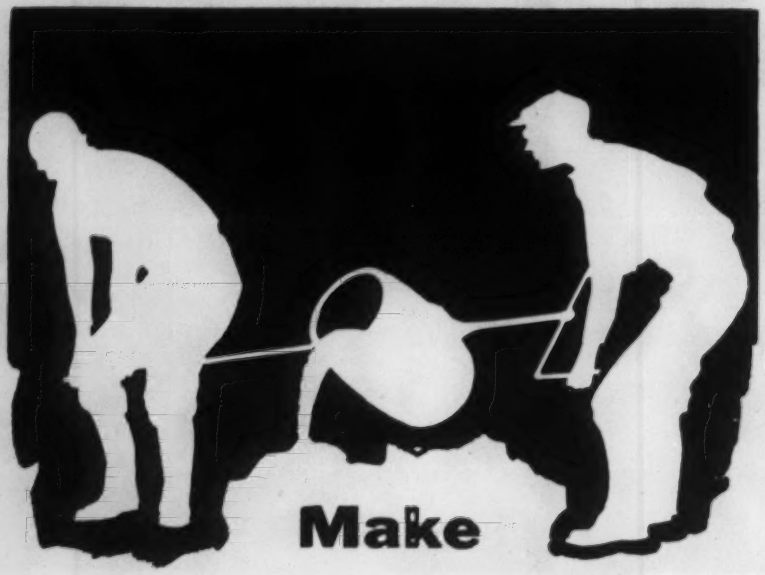
PLANTS: Worcester • Akron • Los Angeles WAREHOUSES: Worcester • Chicago • Los Angeles

a subsidiary of **Pittsburgh Steel Company**

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES: Akron • Atlanta • Chicago • Cleveland • Columbus Dallas • Dayton • Detroit • Houston • Los Angeles • New York • Philadelphia Pittsburgh • San Francisco • Tulsa • Warren, Ohio. PLANTS: Monessen, Pa. • Allenport, Pa. • Akron • Los Angeles Warren, Ohio • Worcester, Mass.

(Advertisement)



Make
high-strength
aluminum castings
without heat treatment!

Foundries without heat treating facilities are producing high-strength aluminum castings with Federated's Tenzaloy. Mechanical properties are equivalent or superior to the common heat-treated alloys, and impact strength is greater.

Tenzaloy, a product of Federated research, is a self-aging alloy of the aluminum-zinc-magnesium type. It reaches full strength after a few days aging at room temperature. No special casting precautions or facilities are required.

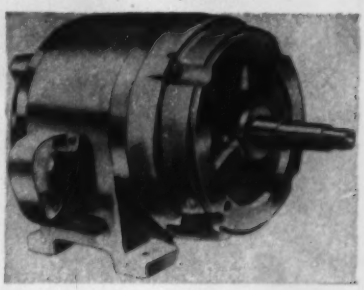
Tenzaloy castings have excellent machinability. They can be anodized to a superior white color. Tenzaloy is one of the few casting alloys that can be brazed at high temperature. It has corrosion resistance equal to or better than the aluminum-silicon alloys.

If your heat treating facilities are inadequate or too costly, or if you are paying for outside work, or if you are casting large and complex aluminum shapes which cannot be conveniently heat treated, call Federated for more information on modern Tenzaloy. Any of our 13 plants and 23 sales offices across the country is ready to help.

Federated Metals

DIVISION OF AMERICAN SMELTING AND REFINING COMPANY
120 BROADWAY, NEW YORK 5, N. Y.
IN CANADA: FEDERATED METALS CANADA, LTD., TORONTO AND MONTREAL
Aluminum, Anodes, Babbitts, Brass, Bronze, Die Casting Metals, Lead and Lead Products, Magnesium, Solders, Type Metals, Zinc Dust

NEW PRODUCTS and equipment



face bracket. A solid flange and brass slinger prevent water from entering the motor. Ratings are from 1 to 30 hp. *Write*: U. S. Electrical Motors Inc., Box 2058, Terminal Annex, Los Angeles 54, Calif. *Phone*: Adams 3-3131

Bar Shear

Cold bars up to 1¾-in. square or round are cut by this air-operated shear. It operates on 60 to 125 psi. Normal speed is 2 seconds per cycle.

The shear's 10-in. knives have four cutting edges. Overloading does not hurt the equipment since the limiting factor is the pressure in the air cylinder. *Write*: Curry Air Shear Corp., 941 Oliver Bldg., Pittsburgh 22, Pa. *Phone*: Atlantic 1-1370

Cleated Conveyor Belt

Here is a belt for incline or decline conveying; it has no joints, cracks or gaps. Cleat and body are one piece. The cleat is reinforced with fabric.

Cleats can be made to any height, width or spacing and as stiff or as flexible as desired. Belts can be supplied in rubber, neoprene

From plant site to producing plant . . .

McKEE ASSURES YOU SOUND ENGINEERING OF EVERY DETAIL OF YOUR NEW PROJECT

● McKee brings to your project a fifty-year background of specialized experience in the design and construction of some of the most complex types of production facilities in use today. But, equally important to you, is the high *quality* of McKee engineering—the meticulous care given to every detail—from studies for selection of the site to completion of the plant ready for operation.

It's this high *quality* of painstaking engineering by McKee that results not only in correct design and efficient layout, but in reduced construction man-hours and most advantageous use of materials. That's why top men in the world-wide industries we serve will tell you "*McKee is the best name you can get*" on the engineering of your new plant.

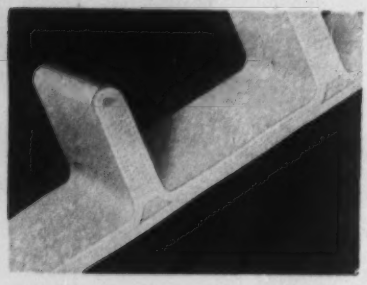
50th ANNIVERSARY

McKee Engineering Services

Arthur G. McKee & Company • Engineers and Contractors

Headquarters: McKee Building • 2300 Chester Avenue • Cleveland 1, Ohio
Offices: New York, N. Y. • Union, New Jersey • Washington, D. C.
British Representatives of Metals Division: Head, Wrightson & Co., Limited
Canada: Arthur G. McKee & Company of Canada, Ltd., 372 Bay St., Toronto

NEW PRODUCTS and equipment

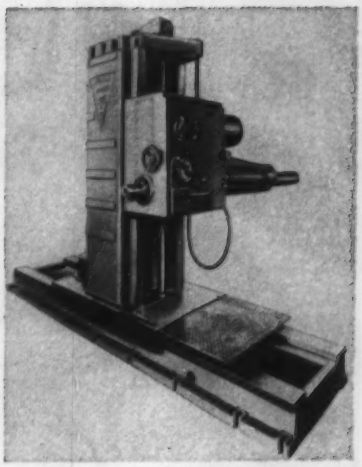


Boring Machine

The larger drilling, reaming, boring, tapping and spot facing operations are done by this new model.

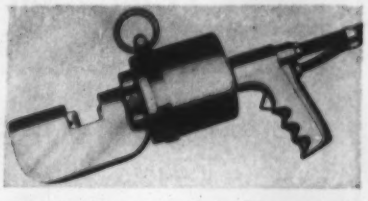
All controls are at the front face of the headstock within easy reach of the operator. Speed and feed changes are made automatically and are dial selected.

Vertical and horizontal travel are 48 in. each; spindle travel is 42 in. Individual motors for vertical and horizontal movement enable the operator to locate his tool simultaneously in two directions. Positioning of the headstock on the column and the column on the runway is controlled automatically. *Write*: Kaukauna Machine Corp., Kaukauna, Wis.



Power Cutter

Steel bars and rods up to 1⅜-in. in diameter can be cut by this portable hydraulic cutter. The unit has a single oil hose and is electrically controlled. The operating button needs but a few ounces of finger pressure to actuate the solenoid valve that sends oil to the cutter head. *Write*: Northcutt Mfg. Co., Kankakee, Ill.



High-Speed Marking

Either serial numbering or detail marking is done by this name plate marking machine. It will mark consecutive serial numbers as well as interchangeable legends on two or more bosses.

Speeds range from 2000 to 5000 plates an hour. *Write*: Cadillac Stamp Co., 17315 Ryan Rd., Detroit 12, Mich. *Phone*: Forest 6-0500

YOU CAN DEPEND ON

GLOBE

SUPERIOR LADLE BRICK

TO ✓ Cut down-time
✓ Lower per ton cost
✓ Increase melting capacity

SERVING THE STEEL INDUSTRY SINCE 1873 ★

The GLOBE BRICK Co.
EAST LIVERPOOL, OHIO

"That Personal Touch . . .

Makes it a PLEASURE to Order from Lamson & Sessions"

"We're just like everyone else . . . production costs keep going up yet we're forced to meet competition by turning out more and better products at a lower cost."

"How to do this, of course, is the big problem. Our engineers say, "Cut this, cheapen that, etc."

"But it took the Lamson man to take our problem personally, Why he acted as if it *were* his problem. In fact, he showed us how a 'standard' Lamson fastener could replace a 'special' at lower cost and still cut assembly time."

Sounds trite? Not at all. Qualified Lamson men solve problems like this every day because they take them to heart, study them and recommend improvements . . . personally, yet backed by the world's leading manufacturer of fasteners.

YOU GET MORE WHEN YOU BUY FROM . . .

Lamson & Sessions

The LAMSON & SESSIONS Co.

1971 West 85TH St. • Cleveland 2, Ohio

CLEVELAND AND KENT, OHIO • BIRMINGHAM • CHICAGO

NEW Literature

Write directly to the company for a copy

Surface Grinders

A hand-fed grinder and its features are illustrated—catalog D55, 6 pages. Thompson Grinder Co., Springfield, O.

Variable Speed Drives

The inner workings of positive pulley design and information on drive selection are given—8 pages. Sterling Electric Motors Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.

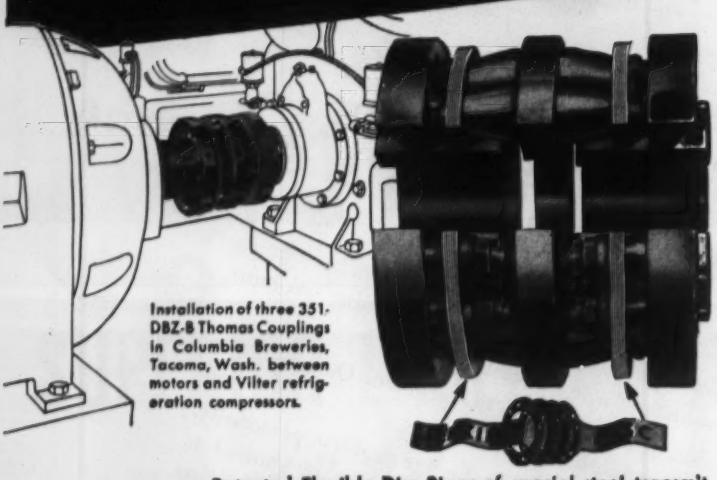
Electric Furnaces

Heat treating furnaces and ovens are described and dimensions and specifications given—catalog G-7, 20 pages. Cooley Electric Mfg. Corp., Shelby and Daly St., Indianapolis 7, Ind.

Magnetic Pulleys

Here is a simplified method for pulley selection—bulletin 303C, 16 pages. Stearns Magnetic Inc., Milwaukee 46, Wis.

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!

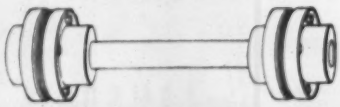


Installation of three 351-DBZ-8 Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention, Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.

THOMAS COUPLINGS ARE MADE FOR A WIDE RANGE OF SPEEDS, HORSEPOWER AND SHAFT SIZES.



Write for our new Engineering Catalog No. 51A

THOMAS

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

Power Presses

Specifications for a line of presses (2 to 85-tons) are given—bulletin 855, 8 pages. Sales Service Machine Tool Co., 2363 University Ave., St. Paul 14, Minn.

Cable Joints

This pocket-size book gives directions for making all types of cable joints with Anaconda Wire & Cable Co.'s neoprene-jacketed cables. Press Department, Kenyon & Eckhardt Inc., 247 Park Ave., New York 17, N. Y.

Investment Casting

Steps in investment casting and the wide range of parts produced are included with a table of investment casting alloys—12 pages. Microcast Division, Austenal Laboratories Inc., 224 E. 39th St., New York, N. Y.

Aluminum Alloys

Properties, fabricating characteristics, typical applications and available size range of each alloy are given—6 pages. Peter A. Frasse & Co. Inc., 17 Grand St., New York 13, N. Y.

Ceramic Magnets

These permanent magnets ($BaFe_{12}O_{19}$) feature light weight and high coercive force—catalog 15, 4 pages. Indiana Steel Products Co., Valparaiso, Ind.

Mica Insulation

Tables and illustrations tell how bonded mica insulation is used. Examples: Fabricated parts, plates, sheets, segments, tapes, tubes and V-rings—catalog M-55, 14 pages. Continental-Diamond Fibre Division, Budd Co. Inc., Newark, Del.

Centrifugal Pumps

General - purpose, cradle - mounted pumps with capacities of from 5 to 2800 gpm are covered—form 7223-A, 16 pages. Cameron Pump Division, Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

Radial Ball Bearings

Here is the description of over 500 standard ball bearings tabulated by bore size (from 0.0250 to 0.250 in.)—24 pages. Engineering Department, Miniature Precision Bearings Inc., Keene, N. H.

Steel Strapping Machine

Here is the description of a round steel strapping machine—4 pages. Gerrard Steel Strapping Division, U. S. Steel Corp., 2915 W. 47th St., Chicago 32, Ill.

UNITED

ENGINEERING AND FOUNDRY COMPANY

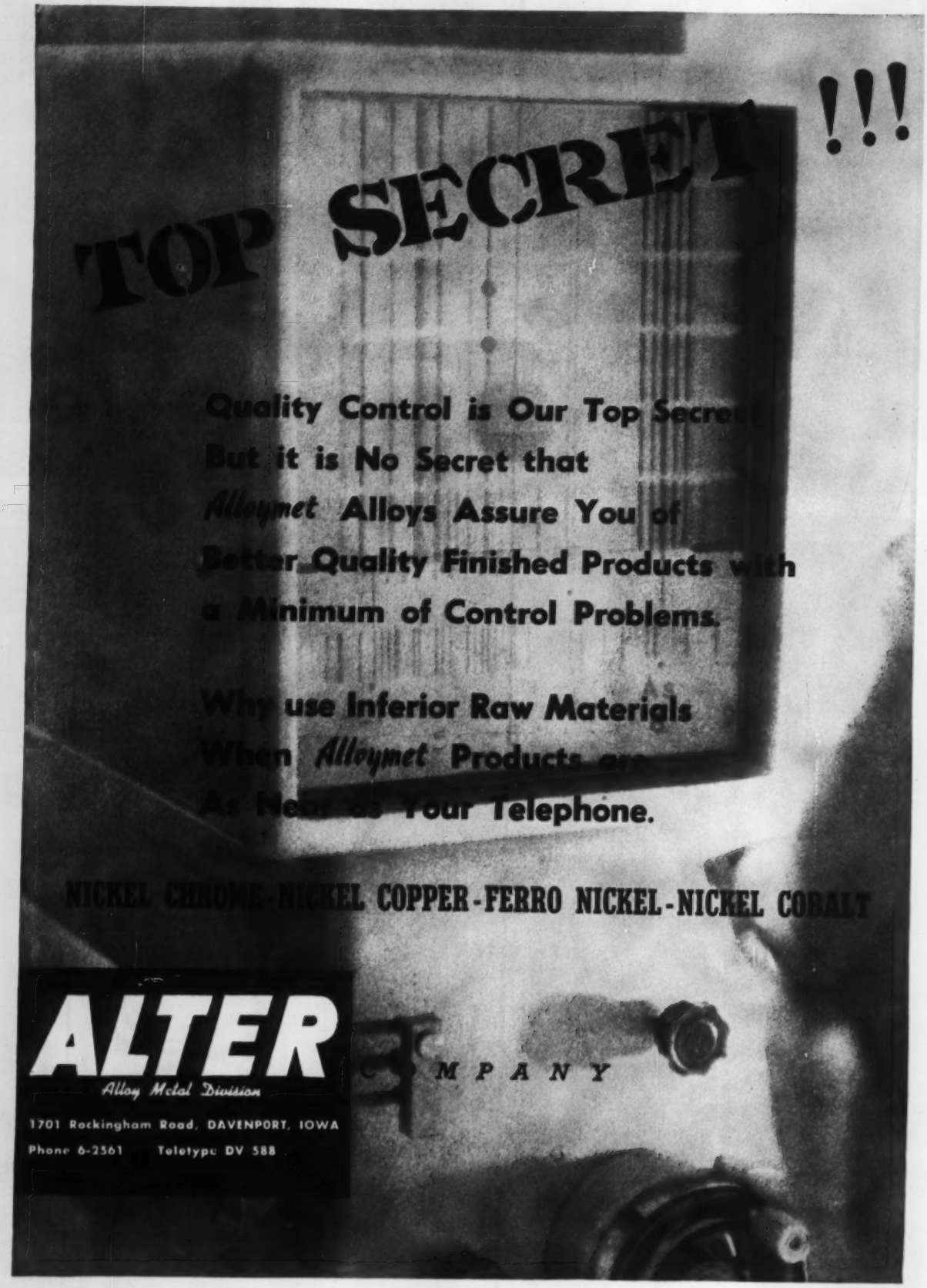
PITTSBURGH, PENNSYLVANIA

Plants at: PITTSBURGH • VANDERGRIFT • YOUNGSTOWN • CANTON
WILMINGTON (LOBDELL UNITED DIVISION)

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, IND.

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

OUTLOOK MA


TOP SECRET !!!
Quality Control is Our Top Secret
But it is No Secret that
Alloymet Alloys Assure You of
Better Quality Finished Products with
a Minimum of Control Problems.
Why use Inferior Raw Materials
When Alloymet Products are
As Near as Your Telephone.
NICKEL CHROME-NICKEL COPPER-FERRO NICKEL-NICKEL COBALT
ALTER
Alloy Metal Division
1701 Rockingham Road, DAVENPORT, IOWA
Phone 6-2561 Teletype DV 588
COMPANY

Market Outlook

STEEL may be a little easier to get in 1956.

Here's why: 1. The automobile industry may use less steel. 2. The steel industry will have more capacity.

Joseph E. Bayne, sales chief of Ford Motor Co.'s Mercury division, predicted at a press preview that 6.5 million to 7 million passenger cars will be built in the United States next year. That would be 6.5 to 13 per cent below the anticipated 7.5 million of this year.

EFFECT— If an auto decline is midway between those two points (10 per cent), it would be equivalent to the auto industry's being out of the steel market for five weeks next year. Since the auto industry is the largest consumer of steel, a five-week absence from the steel market would leave about 1.8 million net tons of finished steel available for other consumers. That's enough to supply the agricultural implement and equipment business for a whole year.

WELL SUSTAINED— A decline in next year's auto output will not ease steel ordering immediately. Initial demand for 1956 models should sustain the automotive industry's steel requirements for several months at least. The construction industry and the railroads want a lot of steel, too. Under these circumstances, no one is inclined to reduce his orders, particularly when he knows there's little chance to get on mill order books for delivery before January.

INTO 1956— Mills are beginning to show interest in orders for the first quarter. Some are being cautious though. They are opening for first quarter on a month-to-month basis instead of for a full quarter. They want to keep a closer check to avoid overloads of orders.

One thing that will favor mills next year will be increased capacity—not only for ingots but for finished steel. Expansion and rehabilitation, although modest compared with programs in 1952 and 1953, will improve the capability of mills to turn out steel. Armco Steel Corp., for instance, will increase its ingot capacity about 360,000 tons a year by the completion of construction of two open hearths at Middletown, O., early in 1956. Jones & Laughlin Steel Corp. is spending $50 million this year to add to its finishing facilities at Pittsburgh and Aliquippa, Pa.

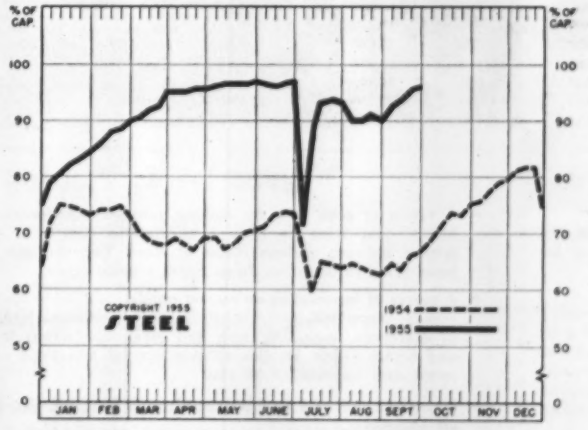
HANDICAPPED— Meanwhile, some consumers are pinched by inadequate supplies of steel. One is A. O. Smith Corp. It reduced operations at its Milwaukee pipe mill from two shifts to one because of a shortage of plates.

In contrast, there's no lack of tin plate, although efforts of canmakers and other users to get maximum shipments before the Oct. 1 price rise (see p. 173) might suggest there is a shortage. Use of cans for the food pack this summer didn't come up to expectations.

OUTPUT UP— Mills are pushing hard to fill the flood of steel orders on their books. In the week ended Sept. 25, they produced steel for ingots and castings at 96 per cent of capacity. That was an increase of 0.5 point over the preceding week and marked the fourth consecutive week of rise.

PRICES— Selling prices of steel are steady, so STEEL's arithmetical price composite on finished steel remains at $127.41 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Sept. 25	Change	Same Week 1954	Same Week 1953
Pittsburgh	99.5	+ 2	67	97.5
Chicago	96	— 0.5*	69.5	100
Mid-Atlantic	93	0	58	96
Youngstown	100	0	51.5	104
Wheeling	96.5	— 0.5	86.5	97.5
Cleveland	101	+ 2.5*	80	100.5
Buffalo	105	0	61	106.5
Birmingham	95.5	0	75	96.5
New England	88	+ 2	49	85
Cincinnati	85	— 4.5	62	78.5
St. Louis	92.5	—13.5	69	89
Detroit	95	+ 1	70	102
Western	94	— 9	81	103
National Rate	96	+ 0.5	66.5	94.5

INGOT PRODUCTION‡

	Week Ended Sept. 25	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	143.7†	143.7†	136.1	101.9
NET TONS (In thousands)	2,309†	2,309	2,186	1,637

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,284,549 in 1954; 2,254,459 in 1953.

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Sept. 20 1955	Sept. 13 1955	Month Ago	Aug. Average
(1947-1949=100)	153.9	153.9	153.9	153.9

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 20

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.800	Sheets, Electrical	$10.200
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	7.993
Tie Plates	5.625	Strip, C.R., Stainless, 430 (lb)	0.444
Axles, Railway	8.000	Strip, H.R., Carbon	5.350
Wheels, Freight Car, 33 in. (per wheel)	52.50	Pipe, Black, Buttweld (100 ft)	16.366
Plates, Carbon	4.950	Pipe, Galv., Buttweld (100 ft)	19.971
Structural Shapes	4.867	Pipe, Line (100 ft)	158.925
Bars, Tool Steel, Carbon (lb)	0.460	Casing, Oil Well, Carbon (100 ft)	165.120
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	Casing, Oil Well, Alloy (100 ft)	244.670
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.80 (lb)	1.185	Tubes, Boiler (100 ft)	39.470
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.680	Tubing, Mechanical, Carbon	20.980
Bars, H.R., Alloy	9.375	Tubing, Mechanical Stainless, 304 (100 ft)	178.897
Bars, H.R., Stainless, 303 (lb)	0.450	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.350	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	5.313	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.660	Wire, Drawn, Carbon	8.575
Bars, C.F., Alloy	12.175	Wire, Drawn, Stainless, 430 (lb)	0.578
Bars, C.F., Stainless, 302 (lb)	0.468	Bale Ties (bundle)	6.473
Sheets, H.R., Carbon	5.145	Nails, Wire, 8d Common	8.618
Sheets, C.R., Carbon	6.239	Wire, Barbed (80-rod spool)	7.847
Sheets, Galvanized	7.690	Woven Wire Fence (20-rod roll)	18.635
Sheets, C.R., Stainless, 302 (lb)	0.588		

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 21 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	207.63	207.63	207.63	194.19	156.99
Index in cents per lb	5.625	5.625	5.625	5.261	4.253

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$127.41	$127.41	$127.41	$117.77	$94.50
No. 2 Fdry. Pig Iron, GT	58.99	58.99	58.99	56.54	47.41
Basic Pig Iron, GT	58.49	58.49	58.49	56.04	46.61
Malleable Pig Iron, GT	59.77	59.77	59.77	57.27	48.13
Steelmaking Scrap, GT	44.33	44.33	44.33	29.75	40.58

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point

FINISHED STEEL	Sept. 21 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.30	3.45
Bars, H.R., Chicago	4.65	4.65	4.65	4.30	3.45
Bars, H.R., deld. Philadelphia	4.90	4.90	4.90	4.55	3.93
Bars, C.F., Pittsburgh	5.90	5.90	5.90	5.40	4.10-4.15
Shapes Std., Pittsburgh	4.60	4.60	4.60	4.25	3.40
Shapes, Std., Chicago	4.60	4.60	4.60	4.25	3.40
Shapes, deld., Philadelphia	4.88	4.88	4.88	4.53	3.46
Plates, Pittsburgh	4.50	4.50	4.50	4.225	3.50
Plates, Chicago	4.50	4.50	4.50	4.225	3.50
Plates, Coatesville, Pa.	4.50	4.50	4.50	4.225	3.90
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.225	3.50
Plates, Claymont, Del.	4.50	4.50	4.50	4.225	3.90
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.35
Sheets, H.R., Chicago	4.325	4.325	4.325	4.05	3.35
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	4.95	4.10
Sheets, C.R., Chicago	5.325	5.325	5.325	4.95	4.10
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.10	4.30
Sheets, Galv., Pittsburgh	5.85	5.85	5.85	5.45	4.40
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.50
Strip, H.R., Chicago	4.325	4.325	4.325	4.05	3.25
Strip, C.R., Pittsburgh	6.25-6.45	6.25-6.45	6.25-6.45	5.75	4.15-4.50
Strip, C.R., Chicago	6.35-6.45	6.35-6.45	6.35-6.45	6.00	4.30
Strip, C.R., Detroit	6.35	6.35	6.35	5.60-5.90	4.35-4.95
Wire, Basic, Pittsburgh	6.25	6.25	6.25	5.75	4.50
Nails, Wire, Pittsburgh	7.60	7.60	7.60	6.85	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$84.50	$84.50	$84.50	$78.00	$63.00
Wire rods, 1/2"-9/32" Pitts.	5.025	5.025	5.025	4.675	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$59.50	$59.50	$59.50	$57.00	$48.50
Basic, Valley	58.50	58.50	58.50	56.00	47.50
Basic, deld. Phila.	59.16	59.16	59.16	49.66	50.39
No. 2 Fdry, Pitts.	59.00	59.00	59.00	56.50	49.50
No. 2 Fdry, Chicago	59.00	59.00	59.00	56.50	46.50
No. 2 Fdry, Valley	59.00	59.00	59.00	56.50	48.00
No. 2 Fdry, deld. Phila.	59.66	59.66	59.66	50.16	50.89
No. 2 Fdry, Birm.	55.00	55.00	55.00	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	62.70	62.70	62.70	60.43	49.08
Malleable, Valley	59.00	59.00	59.00	56.50	48.00
Malleable, Chicago	59.00	59.00	59.00	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	190.00†	175.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$43.50	$43.50	$44.50	$30.50	$44.00
No. 1 Heavy Melt, E. Pa.	46.50	46.50	46.50	28.75	37.75
No. 1 Heavy Melt, Chicago	43.00	43.00	42.00	30.00	40.00
No. 1 Heavy Melt, Valley	46.50	46.50	46.50	32.50	43.75
No. 1 Heavy Melt, Cleve.	44.00	44.00	44.00	30.50	43.25
No. 1 Heavy Melt, Buffalo	38.50	38.50	39.50	28.50	41.50
Rails, Rerolling, Chicago	64.50	64.50	64.50	47.50	59.50
No. 1 Cast, Chicago	47.50	47.50	46.50	35.50	50.50
COKE, Net Ton					
Beehive, Furn, Connlsvl.	$13.625	$13.625	$13.625	$14.75	$14.25
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.75	16.00
Oven, Fdry, Chicago	25.75	25.75	25.75	24.50	21.00

Daily Nonferrous Price Record

	Price Sept. 21	Last Change	Previous Price	Aug. Avg.	July Avg.	Sept. 1954 Avg.
Copper	43.00-50.00	Sept. 12, 1955	43.00	37.759	36.000	30.000
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	14.400
Zinc	13.00	Sept. 6, 1955	12.50	12.500	12.500	11.900
Tin	97.50	Sept. 21, 1955	97.25	96.519	97.045	93.545
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	24.40	Aug. 8, 1955	23.20-24.40	24.267	23.200	22.200
Magnesium	32.50	Aug. 16, 1955	28.50	30.574	28.500	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

What's your shape?

J&L's EXTRUDED SECTIONS

(Hot Extruded and Cold Drawn)

can be custom-made quickly and economically

Now your complex sections can be *custom-made* at J&L's new Hot Extrusion Plant. On J&L's new equipment, they can be preformed to the predominating cross section of the part you wish to produce.

The range of sections that can be custom-made for you is almost unlimited. Quantities are extremely flexible. Production of single extrusions, where necessary, can be arranged.

In addition, J&L's Extruded Sections possess the physical benefits and accurate tolerances derived from cold drawing. And, you can obtain them in a wide range of analyses.

Send your inquiry today!

J & L EXTRUDED SECTIONS
help speed production
reduce over-all costs

J&L STEEL

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

With J&L's Extruded Sections you can:

1. Eliminate time and costs in machining operations.
2. Eliminate time and costs in finishing operations.
3. Reduce scrap losses practically to the zero point.
4. Eliminate the cost of castings and forgings of intricate sections requiring considerable machining.

USE THIS HANDY COUPON

Jones & Laughlin Steel Corporation
3 Gateway Center, Dept. 404, Pittsburgh 30, Pa.

I am interested in knowing what your Extruded Sections can do for me.

NAME _____

TITLE _____

COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____

Nonferrous Metals

Aluminum sets monthly record for fifth time this year. Production runs 14 million lb a month above year-ago levels with no appreciable increase in facilities

Nonferrous Metal Prices, Pages 164 & 165

PRIMARY ALUMINUM production has done it again! For the fifth time this year, a new monthly record was set when primary producers in August registered 267,101,817 lb on the tally sheet of the Aluminum Association.

The previous record was set in July when over 265 million lb of the light metal were produced. Other months to claim short-lived records this year were May, March and January. Prior to that, December, 1954, broke the record held by July, 1954, for the comparatively long period of four months. This amazing industry has broken its own production record six times within the last 12 months! And August's record will be wiped out just as fast as the others were (see page 69).

Magic—When this series of records started, monthly production was 252,323,794 (July, 1954). Since then Anaconda Co. started up its Columbia Falls, Mont., reduction plant, but at the same time Aluminum Co. of America started phasing out its high-cost facilities at Massena, N. Y., and Badin, N. C. In other words, the last 13 months has seen production go up 14,748,644 lb a month over year-ago levels. But there has been little if any significant expansion of plant and equipment to account for it. The answer probably lies in better production techniques and a bigger labor force.

Pressure for increased production is on aluminum just as much as it is on copper—partly because of copper, in fact. As a young, growing industry, it seems more is expected of it than an older one. For instance, aluminum extruders, the fastest growing segment of the industry, expect the supply to keep up with their pace. As a competitive metal, aluminum is pushed by its price, weight and long-range supply advantages over some of the other metals. New uses for the metal are being found faster than potential manufacturers can find the metal to produce them. Many aluminum officials feel that the industry is carrying the burden caused by instability in price or supply of other metals. It's a position they like.

Diane Makes Way for Ione

Last week, the copper and brass mills of New England braced themselves against the rains and winds of a hurricane which never came, wondering if their cleanup operations after Diane were to be for naught. The Copper Division of Business & Defense Services Administration set the damage to the six-state area at nearly $157 million and said that, initially, 32 per cent of the nation's brass mill production was knocked out. Copper & Brass Research Association says it will take American Brass Co. and Chase Brass & Copper Co., Waterbury, Conn., until Nov. 1 to resume full operations. All others will be at former levels by Oct. 1, metal supply and future hurricanes permitting.

Meanwhile, the copper industry has had help from two sources: The U. S. government and the London Metal Exchange. The government released 11,000 tons of copper from stockpile delivery for the fourth quarter and authorized the General Services Administration to sell any copper in the Defense Production Act inventory to defense contractors and hardship cases in the flood-hit area.

While not so direct an influence as the government's, the easing of the LME copper quotation has taken some of the pressure off the price situation on this side of the ocean. Last week, the world market was pegged at about 47 cents a pound, compared with the domestic producers' price of 43 cents and the domestic custom smelters' level of 50 cents. This is the closest the two markets have been since before the Rhodesian strike earlier this year. And the closer they become, the better chance the United States will have of getting more copper from Chile.

Bache & Co., New York, claim that the copper and brass fabricator is getting the worst end of the price deal. He "is being squeezed from both sides. He is unable to get all the copper that he needs from the producers no matter what their price is. Consequently, he must buy additional tonnages in the open market either from custom smelters or from dealers. Yet, he must base the price of his fabricated products as though he were getting all the copper at the producers' price, 43 cents a pound. He must do that to be competitive with the producer-owned fabricating plants. It is the independent that is getting the short end of the stick."

Statistics for the copper industry in August show why the fabricator is having trouble getting his metal. The Copper Institute shows that primary production bounced back from strike-torn July, but only to the tune of 67,635 tons. Normal production would have been over 90,000 tons. Refined production totaled only 98,732 tons, about 35,000 tons short of normal. But shipments to fabricators were 90,078 tons, about 43,000 tons under the last pre-strike month of June.

New Aluminum Market

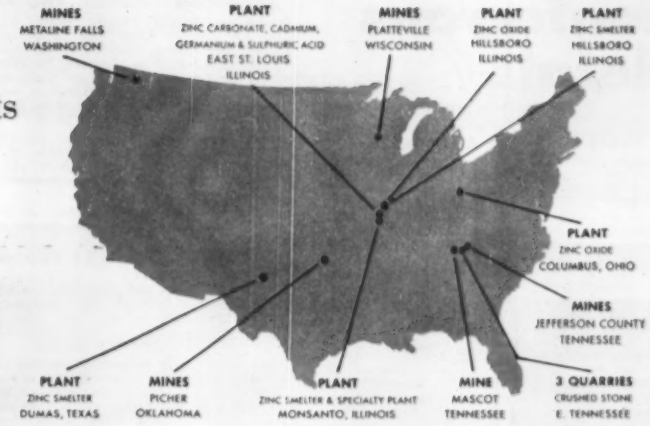
"WE'RE going to transform the transformer industry," said Keen Johnson, vice president of Reynolds Metals Co. He was referring to a new type transformer which uses anodized aluminum strip rather than insulated copper or aluminum magnetic wire for the winding. The strip is coated with 0.0002-in. of aluminum oxide which acts as the insulation. A transformer using aluminum can be the same size as a copper transformer with the same electrical conductivity. The aluminum coil will weigh and cost about half as much as the coil of a copper unit.

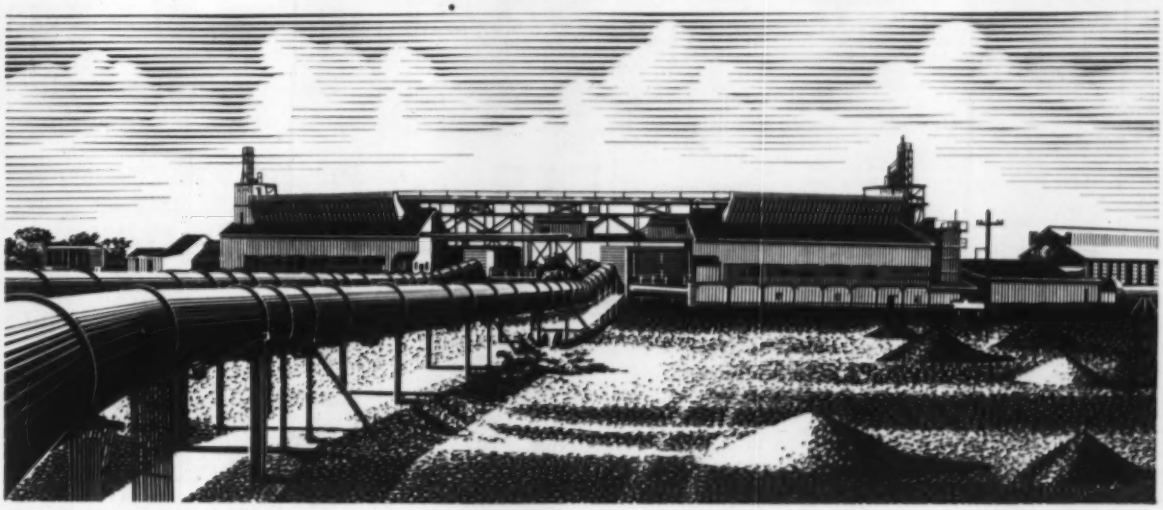
Market Memos

- Beryllium copper scrap users have advanced prices for the second time in two months, partly to offset the higher price of copper. The other part: To stimulate regenerating of scrap and returning it to the mills.
- Shipments of primary magnesium ingots totaled 5112 tons in July, the highest total since October, 1954, but still nearly 1000 tons below the year-ago level. Shipment of 718 tons of wrought products was the low for the year but still well above 1954 levels.

American Zinc and its products

from A *to* Z





DUAL OPERATION AT HILLSBORO, ILLINOIS

(1) The Oxide Division supplies American process lead-free and leaded zinc oxide, as well as French process zinc oxide. (2) In the Metal Division, Prime Western, Select, Brass Special, Intermediate and High Grade slab zinc are produced. For complete picture of American Zinc operations, see map above.

PRODUCERS OF

ALL GRADES OF SLAB ZINC
ZINC ANODES (Plating & Galvanic)
METALLIC CADMIUM
SULPHURIC ACID
LEAD-FREE and LEADED ZINC OXIDES
ZINC CARBONATE
GERMANIUM DIOXIDE
AGRICULTURAL LIMESTONE
CRUSHED STONE

Distributors for

American Zinc sales Company

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, Ohio • Chicago • St. Louis • New York • Detroit • Pittsburgh

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 24.40, pigs 22.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 26.2; No. 43, 5% Si, 26.00; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 28.20; No. 195, 4.5% Cu, 0.8% Si, 27.60; No. 214, 3.8% Mg, 27.80, No. 356, 7% Si, 0.3% Mg, 26.20.

Antimony: R.M.M. brand, 99.5%, 33.00, Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 43.00 deld. Conn. Valley; 43.00 deld. Midwest; custom smelters, 50.00 deld.; Lake, 43.00 deld.; Fire refined, 42.75 deld.

Germanium: 99.9% $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$110 nom, per troy oz.

Lead: Common, 14.80, chemical, 14.90, corroding, 14.90, St. Louis. New York basis, add 0.20.

Lithium: 99% +, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig, 32.50; notched ingot, 33.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.00 for both pig and ingot. Sticks 1.3 in. diameter, 53.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, G, H and R, 36.00; alloy M, 38.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $260-$265 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced, $3-$3.25 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom., per troy oz.

Palladium: $22-$24 per troy oz.

Platinum: $90-$94 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $9-$10 per lb.

Silver: Open market, 90.75 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 97.50; prompt, 97.375.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $3.95, grade A-2 (0.5% Fe max), $3.50 per pound.

Tungsten: Powder, 98.8%, carbon, reduced, 1000-lb lots, $4.50 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 13.00; brass special, 13.25; intermediate, 13.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 14.35; special high grade, 14.50, deld. Diecasting alloy ingot No. 3, 17.25; No. 2, 18.25; No. 5, 17.75, deld.

Zirconium: Ingots, commercial grade, 14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $10 per lb. Powder electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 32.00-33.75; No. 12 foundry alloy (No. 2 grade), 31.00-31.25; 5% silicon alloy, 0.60 Cu max, 32.50-32.75; 13 alloy, 0.60 Cu max, 32.50-32.75; 195 alloy, 32.75; 108 alloy, 31.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 30.50-31.75; grade 2, 29.50-30.75; grade 3, 28.50-30.00; grade 4, 28.00-29.50.

Brass Ingot: Red brass No. 115, 42.50; tin bronze No. 225, 56.50; No. 245, 48.75; high-leaded tin bronze No. 305, 45.75; No. 1 yellow No. 405, 34.75; manganese bronze No. 421, 38.25.

Magnesium Alloy Ingot: AZ63A, 34.00; AZ91B, 34.00; AZ91C, 34.00; AZ92A, 34.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.84; rod, bar, wire, $1.81.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 48.35; 30,000-lb lots 48.88; l.c.l., 48.98. Weatherproof, 100,000-lb lots, 46.03; 30,000-lb lots, 46.28; l.c.l., 46.78. Magnetic wire deld., 15,000 lb or more, 55.52; l.c.l., 56.27.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $20 per cwt; pipe, full coils, $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $14.00-$14.50; sheared mill plate, $11.00; strip, $14.00-$14.50; wire, $10.00-$10.50; forging billets, $8.75; hot-rolled and forged bars, $8.75.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 20.50; plates 19.50-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks		65	

ALUMINUM

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	67.9	66.4	...	...
0.156-0.172	57.5	55.9	...	...
0.188	57.5	55.9	...	71.7
0.219-0.234	54.5	52.9	...	...
0.250-0.281	54.5	52.9	...	68.4
0.313	54.5	52.9	...	65.2
Cold-finished				
0.375-0.547	53.4	51.4	63.7	61.3
0.563-0.688	53.4	51.4	60.6	57.5
0.750-1.000	52.1	50.1	55.4	54.2
1.063	52.1	50.1	...	52.3
1.125-1.500	50.1	48.2	53.6	52.3
Rolled				
1.563	48.8	46.9	...	...
1.625-2.000	48.2	46.2	...	50.5
2.125-2.500	47.0	45.0	...	...
2.563-3.375	45.6	43.6	...	...

ALUMINUM

Sheets and Circles: 110 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	37.5	42.3	...	...
0.135-0.096	38.0	43.2	...	...
0.095-0.077	38.7	44.2	36.1	41.3
0.076-0.061	39.3	45.1	36.3	41.5
0.060-0.048	39.9	45.6	36.7	42.0
0.047-0.038	40.4	46.5	37.2	42.4
0.037-0.039	40.8	47.0	37.6	43.1
0.029-0.024	41.4	47.5	37.9	43.6
0.023-0.019	42.2	49.0	38.8	44.5
0.018-0.017	43.0	...	39.4	45.4
0.016-0.015	43.9	...	40.2	46.6
0.014	44.9	...	41.2	47.9
0.013-0.012	46.1	...	41.9	48.9
0.011	47.1	...	43.1	50.5
0.010-0.0095	48.4	...	44.3	52.2
0.009-0.0085	49.7	...	45.8	54.3
0.008-0.0075	51.3	...	47.0	56.1
0.007	52.8	...	48.5	58.4
0.006	54.4	...	49.9	63.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam. 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	36.5	40.8
5050-F	37.6	41.9
3004-F	38.6	43.8
5052-F	39.9	45.2
6061-T6	41.1	46.0
2024-T4*	43.6	49.9
7075-T6*	51.4	58.5

*24-48 in. widths or diam, 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 39.10-50.10 in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 43.00-56.20 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.85	2	$ 51.95
1	26.50	4	143.00
1¼	35.85	6	256.70
1½	42.90	8	386.30

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032 in., 99c; 0.064 in., 78.00c; 0.125 in., 63.50c, 30,000 lb and over, f.o.b. mill.

Plate: AZ31, 61.00c, 30,000 lb or more, 0.250 in. and over, widths 24-60 in., lengths 72-180 in.; tread plate, 64.00c, 30,000 lb or more, ¼-in. thick, widths 24-60 in., lengths 60-192 in.; tooling plate, 66.00c, 30,000 lbs or more, .250-3.000 in., widths 60-72 in., lengths 72-180 in.

Extrusions: AZ31 commercial grade, rectangles, ¼ x 2 in., 64.70c; 1 x 4 in., 69.50c. Rod, 1 in., 61.50c; 2 in., 59.00c. Tubing, 1 in. OD x 0.065 in., 82.50c; Angles, 1 x 1 x ⅛-in., 68.40c; 2 x 2 x ¼-in., 62.50c. Channels, 3 in., 63.40c. I-beams, 5 in., 62.70c.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 19.50; old sheets, 17.00-17.50; borings and turnings, 11.00-11.50; crankcases, 17.00-17.50; industrial castings, 16.70-17.50.

Copper and Brass: No. 1 heavy copper and wire, 39.00-40.00; No. 2 heavy copper and wire, 38.00-39.00; light copper, 35.00-37.00; No. 1 composition red brass, 30.00-31.50; No. 1 composition turnings, 28.50-30.00; yellow

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	62.76b	60.36c	....	62.82	39.000	39.000	38.250
Yellow Brass	52.27	42.41d	52.81	55.18	28.875	28.625	26.750
Red Brass, 85%	58.09	58.03	58.63	60.90	34.250	34.000	33.500
Low Brass, 80%	56.55	56.49	57.09	59.36	32.750	32.250	31.750
Naval Brass	55.63	49.94	62.69	58.79	26.750	26.500	26.000
Com. Bronze, 90%	60.18	60.12	60.72	62.74	35.750	35.500	35.000
Nickel Silver, 10%	66.00	68.33g	68.33	....	32.500	32.250	16.250
Phos. Bronze, A, 5%	80.99	81.49	81.49	82.67	39.250	39.000	38.000
Silicon Bronze	66.54	65.73	66.58	68.68e	37.625	37.375	36.875
Manganese Bronze	59.37	53.38	63.82	....	27.000	26.750	25.750
Munts Metal	53.74	49.55	....	....	27.000	26.750	26.250

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

brass turnings, 18.50-19.00; new brass clippings, 25.00-25.50; light brass, 18.50-19.50; heavy yellow brass, 22.00-22.50; new brass rod ends, 23.50-24.00; auto radiators, unsweated, 24.00-24.50; cocks and faucets, 24.50-25.00; brass pipe, 25.00-26.00.

Lead: Heavy, 11.50-12.00; battery plates, 6.50-6.75; linotype and stereotype, 14.00-14.25; electrotype, 12.00-12.50; mixed babbitt, 14.50.

Magnesium: Clippings, 18.50-19.50; clean castings, 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.

Monel: Clippings, 44.50-50.00; old sheets, 36.00-44.00; turnings, 34.00; rods, 44.50-55.00.

Nickel: Sheets and clips, 90.00-92.00; rolled anodes, 90.00-92.00; turnings, 75.00; rod ends, 90.00-92.00.

Zinc: Old zinc, 5.50-6.00; new die-cast scrap, 5.00-5.75; old die-cast scrap; 3.50-4.00.

REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 23.00; 3003 clippings, 22.75-23.00; 6151 clippings, 22.50-23.00; 5052 clippings, 22.50-23.00; 2014 clippings, 21.50-22.00; 2017 clippings, 21.50-22.00; 2024 clippings, 21.50-22.00; mixed clippings, 21.50-22.50; old sheet, 19.50; old cast, 19.50; clean old cable (free of steel), 22.50-23.00; borings and turnings, 19.50-20.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 65.00; light scrap, 60.00; turnings and borings, 43.00-55.00.

Copper and Brass: No. 1 copper and wire, 44.00; No. 2 copper and wire, 42.00-42.50; light copper, 39.75-40.00; refinery brass (60% copper) per dry copper content, 38.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 copper and wire, 44.00; No. 2 copper and wire, 42.00-42.50; light copper, 39.75-40.00; No. 1 composition borings, 34.00-34.50; No. 1 composition solids, 34.50-35.00; heavy yellow brass solids, 24.00-25.00; yellow brass turnings, 23.00-25.00; radiators, 26.00-28.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 59.42, oval, 58.92, 5000-10,000 lb; electrodeposited, 56.78, 2000-5000 lb lots; cast 62.54, 5000-10,00 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Tin: Bar or slab, less than 200 lb, $1.155 200-499 lb, $1.14, 500-999 lb, $1.135; 1000 lb or more, $1.13.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100-1000 lb, 80.00; 1000 lb and over, 78.00; effective Sept. 1, 1955.

Copper Sulphate: Crystal, 100 lb, 21.50; 200 lb, 18.50; 300 lb, 17.50; 400 lb, 17.00; 500-1900 lb, 15.50; 2000-10,000 lb, 15.25; 10,000 lb and up, 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 43.50; 400-4900 lb, 41.50; 5000-9900 lb, 39.50; 10,000 lb and over, 38.50. All prices eastern delivery, efective Jan. 1, 1955.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.

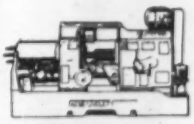
Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 73.00; 100-600 lb, 58.6; 700-1900 lb, 56.1; 2000-9900 lb, 54.4; 10,000 lb or more, 53.2.

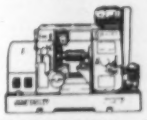
Stannous Chloride (Anhydrous): Less than 50 lb, $1.594; 50 lb, $1.254; 100-300 lb, $1.104; 400-900 lb, $1.08; 1000-1900 lb, $1.055; 2000-4900 lb, $1.019; 5000-19,900 lb, 95.8; 20,000 lb or more, 89.7.

Stannous Sulphate: Less than 500 lb, $1.293; 50 lb, 99.30; 100-1900 lb, 97.30; 2000 lb or more, 95.3.

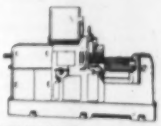
Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.



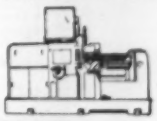
BAR AUTOMATICS
4 Spindle — 7 sizes; 1 to 7⅛"
6 Spindle — 9 sizes; ⅝ to 6"
8 Spindle — 6 sizes; ⅞ to 4"



CHUCKING AUTOMATICS
4 Spindle — 2 sizes; 10 and 12"
6 Spindle — 4 sizes; 5¼ to 12"
8 Spindle — 2 sizes; 6 and 8"



TURRET LATHES
(Bar-Type — Fully Automatic)
Single Spindle — 3 sizes; 3½ to 8½



TURRET LATHES
(Chuck-Type — Fully Automatic)
Single Spindle — to 12" cap.

CHUCKING AUTOMATIC
Single Spindle ("Chuckmatic")
To 12" capacity

Our crystal ball doesn't tell us!
But you don't need a crystal ball to foresee that the *goal* of every machine shop will be the ever faster removal of metal— with accuracy.

Thus the success or failure of cutting tools of the future will depend, as they do today, upon the power, speed and stamina of the machine itself.

While no one knows what tomorrow's tooling techniques may be, you can be certain of one thing—regardless of the demands that increasing speeds and feeds may put on the machine, *you will find more of what is needed* for better overall performance, in an Acme-Gridley.

All Acme-Gridleys (single and multiple spindle—bar and chuck type automatics) are built with a rigidity factor well in *excess* of that needed to withstand the pressure of any cutting tool yet devised—or anticipated.

This is important to you. Such a margin of more-than-needed safety means not only fast, accurate, uninterrupted production today—it also assures new machine productivity with minimum maintenance for years to come.

We would like to give you the whole "*strength-where-it-is-needed*" story at your convenience.

THE NATIONAL ACME COMPANY
189 East 131st Street, Cleveland 8, Ohio

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key on page 167. Key to footnotes, page 169.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$65.50

INGOTS, Alloy (NT)
Detroit R7 .....$69.00
Houston S5 .....74.00
Midland,Pa. C18 .....69.00
Munhall, Pa. U5 .....69.00

BILLETS, BLOOMS & SLABS
Carbon, rerolling (NT)
Aliquippa,Pa. J5 ....$66.50
Bessemer,Pa. U5 ....66.50
Bridgeport,Conn. N19..73.50
Buffalo R2 .....66.50
Clairton,Pa. U5 .....66.50
Ensley,Ala. T2 .....66.50
Fairfield,Ala. T2 .....66.50
Fontana,Calif. K1 ....76.00
Gary,Ind. U5 .....66.50
Johnstown,Pa. B2 ....66.50
Lackawanna,N.Y. B2 ..66.50
LoneStar,Tex. L6 .....74.50
Munhall,Pa. U5 .....66.50
Pittsburgh J5 .....66.50
S.Chicago,Ill. R2, U5..66.50
S.Duquesne,Pa. U5 ...66.50
Youngstown R2 .....66.50

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$84.50
Bessemer,Pa. U5 ....84.50
Bridgeport,Conn. N19..89.50
Buffalo R2 .....84.50
Canton,O. R2 .....86.50
Clairton,Pa. U5 .....84.50
Conshohocken,Pa. A3..89.50
Ensley,Ala. T2 .....84.50
Fairfield,Ala. T2 .....84.50
Fontana,Calif. K1 ....92.00
Gary,Ind. U5 .....84.50
Geneva,Utah C11 .....84.50
Houston S5 .....89.50
Johnstown,Pa. B2 ....84.50
Lackawanna,N.Y. B2..84.50
LosAngeles B3 .....94.00
Midland,Pa. C18 .....84.50
Munhall,Pa. U5 .....84.50
Pittsburgh J5 .....84.50
Seattle B3 .....98.00
S.Chicago R2,U5,W14 ..84.50
S.Duquesne,Pa. U5 ....84.50
S.SanFrancisco B3 ....94.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$96.00
Buffalo R2 .....96.00
Canton,O. R2, T7 ....96.00
Conshohocken,Pa. A3..103.00
Detroit R7 .....96.00
Fontana,Calif. K1 ....115.00
Gary,Ind. U5 .....96.00
Houston S5 .....101.00
Ind.Harbor,Ind. Y1 ...96.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....116.00
Massillon,O. R2 .....96.00
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
S.Chicago R2,U5,W14..96.00
S.Duquesne,Pa. U5 ...96.00
Struthers,O. Y1 .....96.00
Warren,O. C17 .....96.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$103.50
Canton,O. R2 .....103.50
Cleveland R2 .....103.50
Gary,Ind. U5 .....103.50
S.Chicago R2, W14 ...103.50
S.Duquesne,Pa. U5 ...103.50

SKELP
Aliquippa,Pa. J5 ....4.325
LoneStar,Tex. L6 ....4.625
Munhall,Pa. U5 .....4.225
SparrowsPoint,Md. B2..4.225
Warren,O. R2 .....4.225
Youngstown R2, U5 ...4.225

WIRE RODS
AlabamaCity,Ala. R2 ..5.025
Aliquippa,Pa. J5 .....5.025
Alton,Ill. L1 .....5.20
Buffalo B11, W12 ....5.025
Cleveland A7 .....5.025
Donora,Pa. A7 .....5.025
Fairfield,Ala. T2 ....5.025
Houston S5 .....5.275
IndianaHarbor,Ind. Y1..5.025
Johnstown,Pa. B2 ....5.025
Joliet,Ill. A7 .....5.025
KansasCity,Mo. S5 ....5.275
Kokomo,Ind. C16 ....5.125
LosAngeles B3 .....5.825
Minnequa,Colo. C10....5.275
Monessen,Pa. P7 .....5.025
N.Tonawanda,N.Y. B11..5.025
Pittsburg,Calif. C11 ...5.675
Portsmouth P13 .....5.025
Roebling,N.J. R5 ....5.125
S.Chicago,Ill. R2 ....5.025
SparrowsPoint,Md. B2..5.125
Sterling,Ill.(1) N15 ....5.025
Sterling,Ill. N15 .....5.125
Struthers,O. Y1 .....5.025
Worcester,Mass. A7 ...5.325

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....4.60
Aliquippa,Pa. J5 .....4.60
Bessemer,Ala T2 .....4.60
Bethlehem,Pa. B2 .....4.65
Birmingham C15 .....4.60
Clairton,Pa. U5 .....4.60
Fairfield,Ala. T2 .....4.60
Fontana,Calif. K1 ....5.25
Gary,Ind. U5 .....4.60
Geneva,Utah C11 .....4.60
Houston S5 .....4.70
Ind.Harbor,Ind. I-2 ....4.60
Johnstown,Pa. B2 ....4.65
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ...4.65
LosAngeles B3 .....5.30
Minnequa,Colo. C10 ....4.90
Munhall,Pa. U5 .....4.60
Niles,Calif. P1 .....4.90
Portland,Oreg. O4 ....5.35
Phoenixville,Pa. P4 ....5.15
Seattle B3 .....5.35
S.Chicago U5, W14 ....4.60
S.SanFrancisco B3 ....5.25
Torrance,Calif. C11 ....5.30
Weirton,W.Va. W6 .....4.60

Wide Flange
Bethlehem,Pa. B2 ....4.65
Clairton,Pa. U5 .....4.60
Fontana,Calif. K1 ....5.40
Lackawanna,N.Y. B2 ...4.65
Munhall,Pa. U5 .....4.60
Phoenixville,Pa. P4 ....5.15
S.Chicago,Ill. U5 .....4.60

Alloy Std. Shapes
Clairton, Pa. U5 .....5.65
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....5.65
Houston S5 .....5.75
Munhall,Pa. U5 .....5.65
S.Chicago,Ill. U5 .....5.65

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....6.75
Bessemer,Ala. T2 .....6.75
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.75
Fairfield,Ala. T2 .....6.75
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.75
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Ind.Harbor,Ind. I-2, Y1..6.75
Johnstown,Pa. B2 ....6.80
KansasCity,Mo. S5 ....6.85
Lackawanna,N.Y. B2 ..6.80
LosAngeles B3 .....7.45
Munhall,Pa. U5 .....6.75
Seattle B3 .....7.50
S.Chicago,Ill. U5, W14..6.75
S.SanFrancisco B3 ....7.40
Struthers,O. Y1 .....6.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ....6.80
Lackawanna,N.Y. B2 ...6.80
Munhall,Pa. U5 .....6.75
S.Chicago,Ill. U5 .....6.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....4.65
Lackawanna,N.Y. B2 ..4.65
Munhall,Pa. U5 .....4.60
S.Chicago,Ill. U5 .....4.60

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....5.45
Lackawanna,N.Y. B2 ...5.45
Munhall,Pa. U5 .....5.45
S.Chicago,Ill. U5 .....5.45

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....4.50
Aliquippa,Pa. J5 .....4.50
Ashland,Ky.(15) A10 ...4.50
Bessemer,Ala. T2 .....4.50
Bridgeport,Conn. N19 ..4.75
Buffalo R2 .....4.50
Clairton,Pa.' U5 .....4.50
Claymont,Del. C22 ....4.50
Cleveland J5, R2 .....4.60
Coatesville,Pa. L7 ....4.50
Conshohocken,Pa. A3 ..4.50
Detroit M1 .....4.60
Ecorse,Mich. G5 .....4.60
Fairfield,Ala. T2 .....4.50
Fontana,Calif.(30) K1 ..5.15
Gary,Ind. U5 .....4.50
Geneva,Utah C11 .....4.50
GraniteCity,Ill. G4 ....4.70
Harrisburg,Pa. C5 .....5.10
Houston S5 .....4.60
Ind.Harbor,Ind. I-2, Y1..4.50
Johnstown,Pa. B2 ....4.50
Lackawanna,N.Y. B2 ...4.50
LoneStar,Tex. L6 .....4.85
Mansfield,O. E6 .....4.50
Minnequa,Colo. C10 ....5.35
Munhall,Pa. U5 .....4.50
Newport,Ky. N9 .....4.50
Pittsburgh J5 .....4.50
Riverdale,Ill. A1 .....4.50
Seattle B3 .....5.40
Sharon,Pa. S3 .....4.50
S.Chicago R2, U5, W14..4.50
SparrowsPoint,Md. B2 ..4.50
Steubenville,O. W10 ...4.50
Warren,O. R2 .....4.50
Weirton,W.Va. W6 ....4.50
Youngstown R2, U5, Y1..4.50

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 ....6.30
Geneva,Utah C11 .....5.65
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron
Economy,Pa. B14 ....10.40

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.725
Bessemer,Ala. T2 .....6.725
Clairton,Pa. U5 .....6.725
Cleveland J5, R2 .....6.725
Coatesville,Pa. L7 ....6.725
Conshohocken,Pa. A3 ..6.725
Ecorse,Mich. G5 .....6.825
Fairfield,Ala. T2 .....6.725
Fontana,Calif.(30) K1..7.375
Gary,Ind. U5 .....6.725
Geneva,Utah C11 .....6.725
Houston S5 .....6.825
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 .....6.725
LosAngeles B3 .....7.625
Munhall,Pa. U5 .....6.725
Pittsburgh J5 .....6.725
Seattle B3 .....7.625
Sharon,Pa. S3 .....6.725
S.Chicago,Ill. U5, W14..6.725
SparrowsPoint,Md. B2..6.725
Youngstown U5, Y1 ...6.725

PLATES, Alloy
Bridgeport,Conn. N19 ...6.55
Claymont,Del. C22 ....6.30
Coatesville,Pa. L7 ....6.30
Fontana,Calif. K1 ....6.95
Gary,Ind. U5 .....6.30
Houston S5 .....6.40
Ind.Harbor,Ind. Y1 ....6.30
Johnstown,Pa. B2 .....6.30
Munhall,Pa. U5 .....6.30
Newport,Ky. N9 .....6.30
Seattle B3 .....7.20
Sharon,Pa. S3 .....6.30
S.Chicago,Ill. U5, W14..6.30
SparrowsPoint,Md. B2 ..6.30
Youngstown Y1 .....6.30

FLOOR PLATES
Cleveland J5 .....5.575
Conshohocken,Pa. A3 ..5.575
Harrisburg,Pa. C5 .....5.575
Ind.Harbor,Ind. I-2 ....5.575
Munhall,Pa. U5 .....5.575
S.Chicago,Ill. U5 .....5.575

PLATES, Ingot Iron
Ashland c.l. (15) A10...4.75
Ashland l.c.l (15) A10..5.25
Cleveland c.l. R2 .....5.10
Warren,O. c.l. R2 ....5.10

BARS

BARS, Hot-Rolled Carbon
Ala.City,Ala. R2 .....4.65
Aliquippa,Pa. J5 .....4.65
Alton,Ill. L1 .....4.85
Atlanta A11 .....4.85
Bessemer,Ala. T2 .....4.65
Birmingham C15 .....4.65
Bridgeport,Conn. N19 ..4.80
Buffalo R2 .....4.65
Canton,O. R2 .....4.75
Clairton,Pa. U5 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala. T2 .....4.65
FairlessHills,Pa. U5 ..4.80
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.65
Houston S5 .....4.90
Ind.Harbor,Ind. I-2, Y1..4.65
Johnstown,Pa. B2 .....4.65
Joliet,Ill. P22 .....4.65
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ...4.65
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.75
Midland,Pa. C18 .....4.65
Milton,Pa. M18 .....4.65
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.00
N.Tonawanda,N.Y. B11..4.65
Pittsburg,Calif. C11 ...5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
Seattle B3, N14 .....5.40
S.Chicago R2, U5, W14..4.65
S.Duquesne,Pa. U5 ....4.65
S.SanFran.,Calif. B3 ...5.40
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ....5.35
Warren,O. R2 .....4.65
Weirton,W.Va. W6 .....4.65
Youngstown R2, U5 ....4.65

BARS, H.R. Leaded Alloy
Warren,O. C17 .....6.325

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....5.575
Bridgeport,Conn. N19 ..5.725
Buffalo R2 .....5.575
Canton,O. R2, T7 ....5.575
Clairton,Pa. U5 .....5.575
Detroit R7 .....5.575
Ecorse,Mich. G5 .....5.675
Fontana,Calif. K1 ....6.625
FairlessHills,Pa. U5 ...5.725
Gary,Ind. U5 .....5.575
Houston S5 .....5.825
Ind.Harbor,Ind. I-2, Y1..5.575
Johnstown,Pa. B2 .....5.575
KansasCity,Mo. S5 ....5.825
Lackawanna,N.Y. B2 ...5.575
LosAngeles B3 .....6.625
Massillon,O. R2 .....5.575
Midland,Pa. C18 .....5.575
S.Chicago R2, U5, W14..5.575
S.Duquesne,Pa. U5 ....5.575
Struthers,O. Y1 .....5.575
Warren,O. C17 .....5.575
Youngstown U5 .....5.575

BARS & SMALL SHAPES, H.S.
High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.80
Bessemer,Ala. T2 .....6.80
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.80
Cleveland R2 .....6.80
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....6.80
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
Ind.Harb.,Ind. I-2, Y1 ..6.80
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 ....7.05
Lackawanna,N.Y. B2 ...6.80
LosAngeles B3 .....7.50
Pittsburgh J5 .....6.80
Seattle B3 .....7.55
S.Chicago W14 .....6.80
S.Duquesne,Pa. U5 ....6.80
S.SanFrancisco B3 ....7.55
Struthers,O. Y1 .....6.80
Warren,O. R2 .....6.80
Youngstown U5 .....6.80

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa. B2 .....4.80

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.65
Atlanta A11 .....4.85
Fontana,Calif. K1 .....5.35
Niles,Calif. P1 .....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 ....5.05
SanFrancisco S7 .....5.05

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.65
Gary,Ind. U5 .....5.65
Houston S5 .....5.90
KansasCity,Mo. S5 ....5.90
Youngstown U5 .....5.65

BARS, C.F. Loaded Alloy
Ambridge,Pa. W18 ...8.325
Camden,N.J. P13 .....8.50
Chicago W18 .....8.325
Cleveland C20 .....8.325
Monaca, Pa. S17 ....8.325
Newark,N.J. W18 .....8.50
SpringCity,Pa. K3 ....8.50
Warren,O. C17 .....8.325

BARS, Cold-finished Carbon
Ambridge,Pa. W18 ....5.90
BeaverFalls,Pa. M12,R2..5.90
Buffalo B5 .....5.95
Camden,N.J. P13 .....6.35
Carnegie,Pa. C12 .....5.90
Chicago W18 .....5.90
Cleveland A7, C20 ....5.90
Detroit R7 .....5.90
Detroit B5, P17 .....6.10
Donora,Pa. A7 .....5.90
Elyria,O. W8 .....5.90
FranklinPark,Ill. N5 ...5.90
Gary,Ind. R2 .....5.90
GreenBay,Wis. F7 .....5.90
Hammond,Ind. L2, M13..5.90
Hartford,Conn. R2 ....6.40
Harvey,Ill. B5 .....5.90
LosAngeles R2, S30 ....7.35
Mansfield,Mass. B5 ....6.45
Massillon,O. R2, R8 ....5.90
Midland,Pa. C18 .....5.90
Monaca,Pa. S17 .....5.90
Newark,N.J. W18 .....6.35
NewCastle,Pa.(17) B4 ..5.90
Pittsburgh J5 .....5.90
Plymouth,Mich. P5 ....6.15
Putnam,Conn. W18 ....6.45
Readville,Mass. C14 ....6.45
S.Chicago,Ill. W14 ....5.90
SpringCity,Pa. K3 ....6.35
Struthers,O. Y1 .....5.90
Waukegan,Ill. A7 .....5.90
Worcester,Mass. W19 ...6.35
Youngstown F3, Y1 ....5.90

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md. C19 ...5.15

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....7.425
BeaverFalls,Pa. M12,R2 7.425
Bethlehem,Pa. B2 .....7.425
Buffalo B5 .....7.425
Camden,N.J. P13 .....7.60
Canton,O. T7 .....7.425
Carnegie,Pa. C12 .....7.425
Chicago W18 .....7.425
Cleveland A7, C20 ....7.425
Detroit R7 .....7.425
Detroit B5, P17 .....7.625
Donora,Pa. A7 .....7.425
Elyria,O. W8 .....7.425
Gary,Ind. R2 .....7.425
GreenBay, Wis. F7 ....7.425
Hammond,Ind. L2, M13..7.425
Hartford,Conn. R2 ....7.725
Harvey,Ill. B5 .....7.425
Lackawanna,N.Y. B2 ...7.425
LosAngeles S30 .....9.10
Mansfield,Mass. B5 ....7.725
Massillon,O. R2, R8 ....7.425
Midland,Pa. C18 .....7.425
Monaca,Pa. S17 .....7.425
Newark,N.J. W18 .....7.60
Plymouth,Mich. P5 ....7.625
S.Chicago W14 .....7.425
SpringCity,Pa. K3 ....7.60
Struthers,O. Y1 .....7.425
Warren,O. C17 .....7.425
Waukegan,Ill. A7 .....7.425
Worcester,Mass. A7 ...7.725
Youngstown F3, Y1 ...7.425

BARS, Reinforcing
(To Fabricators)
Ala.City,Ala. R2 .....4.65
Atlanta A11 .....4.85
Birmingham C15 .....4.65
Buffalo R2 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala. T2 .....4.65
FairlessHills,Pa. U5 ....4.80
Fontana,Calif. K1 .....5.35
Ft.Worth,Tex.(42) T4 ...5.10
Gary,Ind. U5 .....4.65
Houston S5 .....4.90

Ind.Harbor,Ind. I-2, Y1.4.65
Johnstown,Pa. B2 ....4.65
Joliet,Ill. P22 .....4.65
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.65
LosAngeles B3 .....5.35
Milton,Pa. M18 .....4.65
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.00
Pittsburg,Calif. C11 ....5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
SandSprings,Okla. S5 ..5.15
Seattle B3, N14 .....5.40
S.Chicago R2 .....4.65
S.Duquesne,Pa. U5 ....4.65
S.SanFrancisco B3 ....5.40
SparrowsPoint,Md. B2 ..4.65
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ....5.35
Youngstown R2, U5, Y1.4.65

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2.6.15
KansasCity,Kans. S5 ...6.45
Lackawanna,N.Y. B2 ..6.17
Marion,O. P11 .....5.90
Pittsburgh U8 .....6.17
Seattle B3, N14 .....6.60
SparrowsPt. ¼-1" B2 ..6.15
Williamsport,Pa. S19 ..6.00

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.55
ChicagoHts.(4) C2, I-2..4.65
Ft.Worth,Tex.(26) T4 ..4.95
Franklin,Pa.(3) F5 ....4.55
Franklin,Pa.(4) F5 ....4.65
Marion,O.(3) P11 .....4.50
Moline,Ill.(3) R2 .....4.65
Tonawanda(3) B12 ....4.50
Tonawanda(4) B12 ....4.65
Williamsport,Pa.(3) S19.4.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 11.50
Economy,Pa.(D.R.)B14 14.30
Economy(Staybolt)B14 14.65
McK.Rks. (S.R.) L5 ...11.50
McK.Rks.(D.R.) L5 ...16.00
McK.Rks.(Staybolt) L5.17.00

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.325
Allenport,Pa. P7 .....4.325
Ashland,Ky.(8) A10 ...4.325
Cleveland J5, R2 .....4.325
Conshohocken,Pa. A3 ..4.375
Detroit(8) M1 .....4.425
Dravosburg,Pa. U5 ....4.325
Ecorse,Mich. G5 .....4.425
Fairfield,Ala. T2 .....4.325
FairlessHills,Pa. U5 ...4.375
Fontana,Calif. K1 .....5.075
Gary,Ind. U5 .....4.325
Geneva,Utah C11 .....4.425
GraniteCity,Ill. G4 ....4.525
Ind.Harbor,Ind. I-2, Y1.4.325
Kokomo,Ind. C16 .....4.425
Lackawanna,N.Y. B2 ..4.325
Mansfield,O. E6, (37)..4.325
Munhall,Pa. U5 .....4.325
Newport,Ky.(8) N9 ....4.325
Niles,O. N12 .....4.325
Pittsburg,Calif. C11 ...5.025
Pittsburgh J5 .....4.325
Portsmouth,O. P12 ....4.325
Riverdale,Ill. A1 .....4.325
Sharon,Pa. S3 .....4.325
S.Chicago,Ill. W14 ....4.325
SparrowsPoint,Md. B2.4.325
Steubenville,O. W10 ...4.325
Warren,O. R2 .....4.325
Weirton,W.Va. W6 ....4.325
Youngstown U5, Y1 ..4.325

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.625
Kokomo,Ind. C16 ....5.475
Niles,O. N12 .....5.325

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....7.20
Youngstown Y1 .....7.20

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 ....6.375
Conshohocken,Pa. A3 ..6.425
Dravosburg,Pa. U5 ....6.375
Ecorse,Mich. G5 .....6.475
Fairfield,Ala. T2 ....6.375
FairlessHills,Pa. U5 ..6.425
Fontana,Calif. K1 ....7.125
Gary,Ind. U5 .....6.375
Ind.Harbor,Ind. I-2, Y1 6.375
Lackawanna(35) B2 ...6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
Sharon,Pa. S3 .....6.375
S.Chicago,Ill. U5 .....6.375
SparrowsPoint(36) B2.6.375
Warren,O. R2 .....6.375
Weirton,W.Va. W6 ....6.375
Youngstown U5, Y1 ...6.375

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.575
Cleveland R2 .....4.925
Ind.Harbor,Ind. I-2 ...4.575
Warren,O. R2 .....4.925

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....5.325
Cleveland J5, R2 .....5.325
Conshohocken,Pa. A3 ..5.375
Dravosburg,Pa. U5 ....5.325
Detroit M1 .....5.325
Ecorse,Mich. G5 .....5.425
Fairfield,Ala. T2 .....5.325
FairlessHills,Pa. U5 ...5.375
Follansbee,W.Va. F4 ..5.325
Fontana,Calif. K1 ....6.425
Gary,Ind. U5 .....5.325
GraniteCity,Ill. G4 ...5.525
Ind.Harbor,Ind. I-2, Y1 5.425
Lackawanna,N.Y. B2 ..5.325
Mansfield,O. E6 .....5.325
Middletown,O. A10 ....5.225
Newport,Ky. N9 .....5.325
Pittsburg,Calif. C11 ..6.275
Pittsburgh J5 .....5.225
Portsmouth,O. P12 ....5.325
SparrowsPoint,Md. B2..5.325
Steubenville,O. W10 ...5.325
Warren,O. R2 .....5.325
Weirton,W.Va. W6 ....5.425
Youngstown Y1 .....5.325

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 ....7.875
Dravosburg,Pa. U5 ....7.875
Ecorse,Mich. G5 .....7.975
FairlessHills,Pa. U5 ..7.925
Fontana,Calif. K1 ....8.975
Gary,Ind. U5 .....7.875
IndianaHarbor,Ind. Y1.7.875
Lackawanna(37) B2 ...7.875
Pittsburgh J5 .....7.875
SparrowsPoint(38) B2 .7.875
Warren,O. R2 .....7.875
Weirton,W.Va. W6 ....7.875
Youngstown Y1 .....7.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.925
Middletown,O. A10 ....5.825
Warren,O. R2 .....5.925

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky	A10.6.90	...
Canton,O.	R2 ....6.10	6.56
Dravosburg	U5 ...6.10	...
Fairfield	T2 .....6.10	...
Gary,Ind.	U5 ....6.10	6.35
Ind.Harbor	I-2 ...6.10	6.35
Kokomo,Ind.	C16.6.20	...
MartinsFry.	W10.6.10	...
Newport,Ky	N9 ..6.10	6.35
Pitts.,Calif.	C11..6.85	...
SparrowsPt.	B2 ..6.10	...

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....7.15
Gary,Ind. U5 .....6.35
MartinsFry.O, W10 ....6.35

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....5.85‡
Ashland,Ky. A10 ....5.85†
Canton,O. R2 .....5.85‡
Delphos,O. N16 .....6.60‡
Dover, O. R1 .....5.85‡
Dravosburg,Pa. U5 ...5.85†
Fairfield,Ala. T2 ....5.85†
Gary,Ind. U5 .....5.85*
GraniteCity, Ill. G4 ...6.05
Ind.Harbor,Ind. I-2 ...5.85†
Kokomo,Ind. C16 .....5.95‡
MartinsFerry,O. W10 ..5.85*
Middletown,O. A10 ....5.85†
Newport,Ky. N9 .....5.85‡
Niles,O. N12 .....6.85‡
Pittsburg,Calif. C1 ...6.60*
SparrowsPt.,Md. B2 ...5.85†
Steubenville,O. W10 ...5.85‡
Warren,O. R2 .....5.85†
Weirton,W.Va. W6 ....5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.575

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ....6.60
SparrowsPoint(39) B2 ..6.60

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.35
Dravosburg,Pa. U5 ....6.35
Kokomo,Ind. C16 .....6.60
Newport,Ky. N9 .....6.35
Niles,O. N12 .....7.35

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....6.10
Canton,O. R2 .....6.60
Middletown,O. A10 ....6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 ....6.70
Niles,O.(28) R2 .....6.70
Weirton,W.Va. W6 ....6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).8.50
Butler,Pa. A10 (type 2).8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 .....5.90
Cleveland R2 .....5.90
Dravosburg,Pa. U5 ....5.90
Gary,Ind. U5 .....5.90
GraniteCity,Ill. G4 ....6.10
Ind.Harbor,Ind. I-2 ...5.90
Middletown,O. A10 ....5.90
Niles,O. N12 .....5.90
Youngstown Y1 .....5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...7.75
Yorkville,O. W10 ....7.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.35
Gary,Ind. U5 .....6.35
Mansfield,O. E6 .....6.35
Middletown,O. A10 ....6.35
Niles,O. N12 .....6.35
Weirton,W.Va. W6 ....6.35

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.65

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins,E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W.Co.
N16 New Delphos Mfg.Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division. Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Division, H. K. Porter Co, Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.325
Allenport,Pa. P7	4.325
Alton,Ill. L1	4.50
Ashland,Ky.(8) A10	4.325
Atlanta A11	4.525
Bessemer,Ala. T2	4.325
Birmingham C15	4.325
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	4.325
Conshohocken,Pa. A3	4.375
Detroit M1	4.425
Ecorse,Mich. G5	4.425
Fairfield,Ala. T2	4.325
Fontana,Calif. K1	5.075
Gary,Ind. U5	4.325
Ind.Harbor,Ind. I-2, Y1	4.325
Johnstown,Pa.(25) B2	4.325
Lackaw'na,N.Y.(24) B2	4.325
LosAngeles(25) B3	5.075
Milton,Pa. M18	4.325
Minnequa,Colo. C10	5.425
NewBritain(10) S15	4.325
N.Tonawanda,N.Y. B11	4.325
Pittsburg,Calif. C11	5.075
Portsmouth,O. P12	4.325
Riverdale,Ill. A1	4.325
SanFrancisco S7	5.05
Seattle(25) B3	5.325
Seattle N14	5.40
Sharon,Pa. S3	4.325
S.Chicago,Ill. W14	4.325
S.SanFrancisco(25) B3	5.075
SparrowsPoint,Md. B2	4.325
Sterling(1) N15	4.325
Sterling,Ill. N15	4.425
Torrance,Calif. C11	5.075
Warren,O. R2	4.325
Weirton,W.Va. W6	4.325
Youngstown U5	4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.20
Fontana,Calif. K1	8.85
Gary,Ind. U5	7.20
Ind.Harbor,Ind. Y1	7.20
LosAngeles B3	8.40
Newport,Ky. N9	7.20
Sharon,Pa. S3	7.20
S.Chicago W14	7.20
Youngstown U5, Y1	7.20

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.425
Conshohocken,Pa. A3	6.425
Ecorse,Mich. G5	6.525
Fairfield,Ala. T2	6.425
Fontana,Calif. K1	7.525
Gary,Ind. U5	6.425
Houston S5	6.675
Ind.Harbor,Ind. I-2, Y1	6.425
KansasCity,Mo. S5	6.675
Lackawanna,N.Y. B2	6.425
LosAngeles(25) B3	7.175
Seattle(25) B3	7.425
Sharon,Pa. S3	6.425
S.SanFrancisco(25) B3	7.175
SparrowsPoint,Md. B2	6.425
Warren,O. R2	6.425
Weirton,W.Va. W6	6.425
Youngstown U5, Y1	6.425

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.575
Warren,O. R2	4.925

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.25
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland J5	6.45
Cleveland A7	6.25
Conshohocken,Pa. A3	6.30
Dearborn,Mich. D3	6.35
Detroit D2, M1, P20	6.35
Dover,O. G6	6.25
Ecorse,Mich. G5	6.35
Follansbee,W.Va. F4	6.25
Fontana,Calif. K1	8.00
FranklinPark,Ill. T6	6.35
Ind.Harbor,Ind. I-2	6.35
Ind.Harbor,Ind. Y1	6.45
Indianapolis C8	6.40
Lackawanna,N.Y. B2	6.25
LosAngeles C1	8.50
NewBedford,Mass. R10	6.70
NewBritain(10) S15	6.25
NewCastle,Pa. B4, E5	6.25
NewHaven,Conn. A7	7.00
NewHaven,Conn. D2	6.70
NewKensington,Pa. A6	6.25
Pawtucket,R.I. R3	6.90
Pawtucket,R.I. N8	6.80
Pittsburgh J5	6.45
Portsmouth,O. P12	6.25
Riverdale,Ill. A1	6.35
Rome,N.Y.(32) R6	6.25
Sharon,Pa. S3	6.25
SparrowsPt.,Md. B2	6.25
Trenton,N.J.(31) R5	7.80
Wallingford,Conn. W2	6.70
Warren,O. R2 T5	6.25
Weirton,W.Va. W6	6.25
Worcester,Mass. A7	7.10
Youngstown Y1	6.45
Youngstown C8	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie,Pa. S18	13.45
Cleveland A7	13.45
Dover,O. G6	13.45
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket,R.I. N8	13.80
Sharon,Pa. S3	13.45
Worcester,Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7	9.10
Dearborn,Mich. D3	9.20
Dover,O. G6	9.30
Ecorse,Mich. G5	9.20
Ind.Harbor,Ind. Y1	9.30
Lackawanna,N.Y. B2	9.125
Sharon,Pa. S3	9.10
SparrowsPoint,Md. B2	9.125
Warren,O. R2	9.10
Weirton,W.Va. W6	9.10
Youngstown Y1	9.30

STRIP, Electrogalvanized

Cleveland A7	6.25*
Dover,O. G6	6.25*
Riverdale,Ill. A1	6.55*
Youngstown C8	6.25*
Warren,O. T5	6.25*
Warren,O. B9	6.45*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	7.10*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.55

TIGHT COOPERAGE HOOP

Atlanta A11	5.05
Riverdale,Ill. A1	4.90
Sharon,Pa. S3	4.75
Youngstown U5	4.75

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	7.30	9.25	10.80	12.95	15.65
Boston T6	7.55	9.25	10.80	12.95	15.65
Bristol,Conn. W1	...	...	10.80	12.95	....
Carnegie,Pa. S18	...	8.95	10.50	12.65	....
Cleveland A7	7.00	8.95	10.50	12.65	15.35
Cleveland C7	...	8.95	10.50	12.65	15.35
Dearborn,Mich. D3	7.10	9.05	10.60	....	....
Detroit D2	7.10	9.05	10.60	12.75	....
Dover,O. G6	7.00	8.95	10.50	12.65	15.35
Follansbee,W.Va. F4	7.00	8.95	10.50**	....	....
FranklinPark,Ill. T6	7.10	8.95	10.50	12.65	15.35
Harrison,N.J. C18	...	...	10.80	12.95	15.65
Indianapolis C8	7.15	9.10	10.50	12.65	15.35
NewBritain,Conn.(10) S15	7.00	8.95	10.50	12.65	15.35
NewCastle,Pa. B4, E5	7.00	8.95	10.50	12.65	....
NewHaven,Conn. D2	7.45	9.25	10.80	12.95	....
NewKensington,Pa. A6	7.00	8.95	10.50	....	....
New York W3	...	9.25	10.80	12.95	15.65
Pawtucket,R.I. N8	7.55	9.25	10.80	12.95	15.35
Riverdale,Ill. A1	7.10	8.95	10.50	12.65	15.35
Rome,N.Y.(32) R6	7.00	8.95	10.50	12.65	15.35
Sharon,Pa. S3	7.00	8.95	10.50	12.65	15.35
Trenton,N.J. R5	...	9.25	10.80	12.95	15.65
Wallingford,Conn. W2	7.45	9.25	10.80	12.95	15.65
Warren,O. T5	7.00	8.95	10.50	12.65	15.35
Weirton,W.Va. W6	7.00	8.95	10.50	12.65	15.35
Worcester,Mass. T6	7.55	9.25	10.80	12.95	15.65
Worcester,Mass. A7	7.85	9.25	10.80	12.95	15.65
Youngstown C8	7.00	8.95	10.50	12.65	15.35

**0.065 C, max.

Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	14.40	17.60	....
Buffalo W12	...	...	14.40	....	....
FranklinPark,Ill. T6	...	...	14.90	18.10	21.50
Harrison,N.J. C18	...	...	14.40	17.60	21.00
NewYork W3	...	...	14.40	17.60	21.00
Trenton,N.J. R5	...	...	14.40	17.60	21.00
Worcester,Mass. A7, T6	...	...	14.40	17.60	21.00
Worcester,Mass. W12	...	...	14.40	....	....
Youngstown C8	...	...	14.75	17.95	21.35

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	9.95	10.95	11.85
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles,O. N12	8.40	9.35	9.95	10.95	....
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	...	10.70	11.70	12.60
GraniteCity,Ill. G4	8.80*	9.80*	10.40*	11.40*	....
IndianaHarbor,Ind. I-2	8.60†	9.60*	10.20*	11.20*	....
Vandergrift,Pa. U5	...	10.10†	10.70†	11.70†	12.60†
Vandergrift,Pa. U5	8.60*	9.60*	10.20*	11.20*	12.10*
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60
Zanesville,O. A10	...	10.10	10.70	11.70	12.60

	Transformer Grade			
H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	12.80	13.35	13.85	14.85
Brackenridge,Pa. A4	12.80	....	....	....
Newport,Ky. N9	12.80	....	....	....
Vandergrift,Pa. U5	12.80	13.35	13.85	14.85
Zanesville,O. A10	12.80‡	13.35‡	13.85‡	14.85‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.85	17.45	17.95	13.55‡
Butler,Pa. A10	....	....	17.45	17.95	....
Vandergrift,Pa. U5	14.85	15.85	17.45	17.95	13.55
Warren,O. R2	....	....	....	....	13.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. §Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton, W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.675	6.875	7.075

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.,Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Dravosburg,Pa. U5	6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.65
Gray,Ind. U5	6.65
GraniteCity,Ill. G4	6.75
Ind.Harbor,Ind. Y1	6.65
Yorkville,O. W10	6.65

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$7.85
Gray,Ind. U5	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	6.25
Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.425
Atlanta A11	6.45
Bartonville,Ill. K4	6.35
Buffalo W12	6.25
Chicago W13	6.25
Cleveland A7	6.25
Crawfordsville,Ind. M8	6.35
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fairfield,Ala. T2	6.25
Fostoria,O.(24) S1	6.45
Houston S5	6.50
Jacksonville,Fla. M8	6.77
Johnstown,Pa. B2	6.25
Joliet,Ill. A7	6.25
KansasCity,Mo. S5	6.50
Kokomo,Ind. C16	6.35
LosAngeles B3	7.20
Minnequa,Colo. C10	6.50
Monessen,Pa. P7	6.25
Newark 6-8 ga. I-1	6.90
N.Tonawanda B11	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Portsmouth,O. P12	6.25
Rankin,Pa. A7	6.25
S.Chicago,Ill. R2	6.25
S.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Sterling,Ill.(1) N15	6.25
Sterling,Ill. N15	6.35
Struthers,O. Y1	6.25
Waukegan,Ill. A7	6.25
Worcester,Mass. A7	6.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.90
Alton,Ill. L1	8.075
Bartonville,Ill. K4	8.00
Buffalo W12	7.90
Cleveland A7	7.90
Donora,Pa. A7	7.90
Duluth,Minn. A7	7.90
Fostoria,O. S1	7.95
Johnstown,Pa. B2	7.90
LosAngeles B3	8.85
Milbury,Mass.(12) N6	8.20
Minnequa,Colo. C10	8.15
Monessen,Pa. P16	7.90
Muncie,Ind. I-7	8.10
Palmer,Mass. W12	8.20
Pittsburg,Calif. C11	8.85
Portsmouth,O. P12	7.90
Roebling,N.J. R5	8.20
S.Chicago,Ill. R2	7.90
S.SanFrancisco C10	8.85
SparrowsPt.,Md. B2	8.00
Struthers,O. Y1	7.90
Trenton,N.J. A7	8.20
Waukegan,Ill. A7	7.90
Worcester A7,J4,T6,W12	8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	7.60
Alton,Ill. L1	7.775
Buffalo W12	7.60
Cleveland A7	7.60
Donora,Pa. A7	7.60
Duluth,Minn. A7	7.60
Johnstown,Pa. B2	7.60
KansasCity,Mo. S5	7.85
LosAngeles B3	8.55
Minnequa,Colo. C10	7.775
Monessen,Pa. P16	7.60
NewHaven,Conn. A7	7.90
Palmer,Mass. W12	7.90
Pittsburg,Calif. C11	8.55
Portsmouth,O. P12	7.60
Roebling,N.J. R5	7.90
S.Chicago,Ill. R2	7.60
S.SanFrancisco C10	8.55
SparrowsPoint,Md. B2	7.70
Struthers,O. Y1	7.60
Trenton,N.J. A7	7.90
Waukegan,Ill. A7	7.60
Worcester,Mass. A7	7.90

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	12.725
Bartonville,Ill. K4	12.65
Buffalo W12	12.55
Chicago W13	12.55
Cleveland A7	12.55
Crawfordsville,Ind. M8	12.65
Fostoria,O. S1	12.55
Jacksonville,Fla. M8	13.08
Johnston,Pa. B2	12.55
Kokomo,Ind. C16	12.55
Minnequa,Colo. C10	12.30
Monessen,Pa. P16	12.55
Muncie,Ind. I-7	12.75
Palmer,Mass. W12	12.85
Roebling,N.J. R5	12.85
S.SanFrancisco C10	12.90
Waukegan,Ill. A7	12.55
Worcester,Mass. A7, T6	12.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	10.70
Buffalo W12	10.70
Johnstown,Pa. B2	10.70
Minnequa,Colo. C10	10.825
Monessen,Pa. P16	10.70
Muncie,Ind. I-7	10.90
Pittsburg,Calif. C11	11.50
Portsmouth,O. P12	10.70
Roebling,N.J. R5	11.00
SparrowsPt.,Md. B2	10.80

ROPE WIRE	(A)
Bartonville,Ill. K4	10.55
Buffalo W12	9.75
Fostoria,O.(23) S1	10.55
Johnstown,Pa. B2	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.85
SparrowsPt. B2	10.65
Struthers,O. Y1	10.55
Worcester,Mass. J4	10.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Bartonville,Ill. K4 .....14.15
Monessen,Pa. P16 .....14.20
Roebling,N.J. R5 .....14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 .....9.00
Baltimore T6 .....9.30
Buffalo W12 .....9.00
Cleveland A7 .....9.00
Crawfordsville,Ind. M8..9.00
Dover,O. G6 .....9.00
Fostoria,O. S1 .....9.00
FranklinPark,Ill. T6 ....9.10
Kokomo,Ind. C16 .....9.00
Massillon,O. R8 .....9.00
Milwaukee C23 .....9.20
Monessen,Pa. P16 .....9.00
Pawtucket,R.I. N8 .....9.30
Riverdale,Ill. A1 .....9.10
Rome,N.Y. R6 .....9.00
Trenton,N.J. R5 .....9.30
Worcester A7, T6, W12.9.30

NAIL, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	...152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Chicago,Ill. W13	152
Cleveland A9	157
Crawfordsville,Ind. M8	..154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Galveston,Tex. D7	157
Houston,Tex. S5	157
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
KansasCity,Mo. S5	157
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	..$9.05
Wheeling,W.Va. W10	..9.05

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Crawfordsville,Ind. M8	..154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	..$9.35
Bartonville,Ill. K4	.....9.45
Buffalo W12	.....9.35
Crawfordsville,Ind. M8	..9.46
Donora,Pa. A7	.....9.35
Duluth,Minn. A7	.....9.35
Johnstown,Pa. B2	.....9.35
Joliet,Ill. A7	.....9.35
Kokomo,Ind. C16	.....9.45
LosAngeles B3	.....10.14
Minnequa,Colo. C10	....9.60
Pittsburg,Calif. C11	...10.43
S.Chicago,Ill. R2	.....9.35
SparrowsPt.,Md. B2	...9.45
Sterling,Ill. N15	.....9.35
Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	..$9.65
Bartonville,Ill. K4	.....9.75
Buffalo W12	.....9.60
Crawfordsville,Ind. M8	..9.75
Donora,Pa. A7	.....9.65
Duluth,Minn. A7	.....9.65
Johnstown,Pa. B3	.....9.65
Joliet,Ill. A7	.....9.65
Kokomo,Ind. C16	.....9.75
LosAngeles B3	.....10.45
Minnequa,Colo. C10	....9.90
Pittsburg,Calif. C11	....10.13
S.Chicago,Ill. R2	.....9.65
SparrowsPt.,Md. B2	....9.75
Sterling,Ill. N15	.....9.65
Coil No. 6500 Interim	
AlabamaCity,Ala. R2	..$9.70
Bartonville,Ill. K4	.....9.80
Buffalo W12	.....9.70
Crawfordsville,Ind. M8	..9.80
Donora,Pa. A7	.....9.70
Duluth,Minn. A7	.....9.70
Johnstown,Pa. B2	.....9.70
Joliet,Ill. A7	.....9.70
Kokomo,Ind. C16	.....9.80
LosAngeles B3	.....11.05
Minnequa,Colo. C10	....9.95
Pittsburg,Calif. C11	...10.50
S.Chicago,Ill. R2	.....9.70
SparrowsPt.,Md. B2	....9.80
Sterling,Ill. N15	.....9.70

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	..175**
Aliquippa J5	.....172§
Atlanta A11	181
Bartonville,Ill. K4	181
Crawfordsville,Ind. M8	..181
Donora,Pa. A7	.....175†
Duluth,Minn. A7	.....175†
Fairfield,Ala. T2	.....175†
Houston,Tex. S5	.....180†
Johnstown,Pa. B2	....179*
Joliet,Ill. A7	.....175†
KansasCity,Mo. S5	....180†
Kokomo,Ind. C16	.....177†
Minnequa,Colo. C10	...180**
Monessen,Pa. P7	.....179*
Pittsburg,Calif. C11	...195†
Rankin,Pa. A7	.....175†
S.Chicago,Ill. R2	....175**
S.SanFrancisco C10	...195**
SparrowsPoint,Md. B2	..181*
Sterling,Ill.(1) N15	....179*

WOVEN Fence, 9-15 Ga.

	Col.
Ala.City,Ala. R2	.....162**
Ala.City, 17 ga. R2	..241**
Ala.City, 18 ga. R2	..251**
Aliq'ppa,Pa.9-14½ga J5	165§
Atlanta A11	168
Bartonville,Ill. K4	168
Crawfordsville,Ind. M8	..168
Donora,Pa. A7	.....162†
Duluth,Minn. A7	.....162†
Fairfield,Ala. T2	.....162†
Houston,Tex. S5	.....167†
Johnstown,Pa.(43) B2	..168
Joliet,Ill. A7	.....162†
KansasCity,Mo. S5	....167†
Kokomo,Ind. C16	.....164†
Minnequa,Colo. C10	...167**
Monessen,Pa. 9 ga. P17.	166*
Pittsburg,Calif. C11	...185†
Rankin,Pa. A7	.....162†
S.Chicago,Ill. R2	.....162**
Sterling,Ill.(1) N15	....166*

WIRE (16 Gage)

	An'ld Stone	Galv. Stone
Ala.City R2	..14.50	16.05**
Bartonville,Ill. K4	..14.60	16.50
Buffalo W12	....14.50	....
Cleveland A7	....14.50	....
Crawf'dsville M8	14.60	16.50
Fostoria,O. S1	..14.60	16.15†
Johnstown B2	..14.15	16.40*
Kokomo C16	...14.60	16.15†
Minnequa C10	..14.75	16.45**
Palmer,MassW12	14.50	16.05*
Pitts.,Calif. C11	14.85	16.40†
S.Chicago R2	..14.50	16.05**
SparrowsPt. B2	14.60	16.50*
Sterling(1) N15	14.50	16.45††
Waukegan A7	..14.50	16.05†
Worcester A7	....14.80	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala. R2	7.40	7.80**
Aliquippa J5	....7.40	7.925§
Atlanta A11	.....7.50	8.075
Bartonville(48) K4	7.50	8.075
Buffalo W12	.....7.40	8.80†
Cleveland A7	.....7.40	....
Crawfordsville M8	7.50	8.075
Donora,Pa. A7	...7.40	7.80†
Duluth,Minn. A7	..7.40	7.80†
Fairfield T2	.....7.40	7.80†
Houston,Tex. S5	..7.65	8.05†
Jacksville,Fla.M8	7.90	8.475
Johnstown B2(48)	7.40	7.975*
Joliet,Ill. A7	.....7.40	7.80†
KansasCity,Mo. S5	7.65	8.05†
Kokomo C16	.....7.50	7.90†
LosAngeles B3	..8.35	8.925*
Minnequa C10	...7.65	8.05**
Monessen P7 (48)	7.40	7.975*
Palmer,Mass. W12	7.70	8.10†
Pitts.,Calif., C11	..8.35	8.75†
Portsmouth,O. P12	7.40	....
Rankin A7	.....7.40	7.80†
S.Chicago R2	...7.40	7.80**
S.SanFran. C10	..8.35	8.75**
Spar'wsPt.B2(48)	7.50	8.075*
Str'ling(1)(48)	N15 7.40	8.00††
Struthers,O.(48)	Y1 7.40	7.90‡
Worcester,Mass.	A7 7.70	....

*Based on 12.50c zinc; †5c zinc; §10c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras. ††13c zinc.

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	..157
Duluth,Minn. A7	157
Franklin,Pa. F5	157
Huntington,W.Va. W7	..157
Johnstown,Pa. B2	160
Marion,O. P11	157
Minnequa,Colo. C10	162
Moline,Ill. R2	162
S.Chicago,Ill. R2	157
Tonawanda,N.Y. B12	...157
Williamsport,Pa. S10	160

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, less case lots, per cent off list, f.o.b. midwestern plants)

4" and shorter:
- ½" & smaller diam... +5

Over 4" through 6":
- ½" and smaller diam. +12

6" and shorter:
- ⅜" and ⅝" .....+13
- ¾" and larger .....+16

Longer than 6":
- All diameters .....+25

Lag bolts, all diams:
- 6" and shorter ..... +2
- Over 6" long ..... +11

Ribbed Necked Carriage..+13
Blank 2
Plow 18
Step, Elevator, Tap and Sleigh Shoe 2
Tire Bolts 12
Boiler & Fitting-Up Bolts 14

NUTS

H.P. and C.P., regular & heavy:
- Square, all sizes 51

H.P., Hex. regular & heavy:
- ¾" and smaller 55
- ⅞" to 1¼", inclusive. 55
- 1⅜" to 1½", inclusive 57
- 1⅝" and larger 51

C.P. Hex regular & heavy:
- ⅜" and smaller 55
- Larger than ⅝" 51

Hot Galv. Nuts (all types):
- ⅝" or smaller 38
- ⅞" to 1½", inclusive. 36

Finished Hex Nuts:
- ⅝" and smaller 55
- ⅞" and larger 51

Semifinished & Slotted Hex:
- Regular and heavy, ⅝" and smaller ... 55
- ⅞" and larger 51

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages; plain finish)

3" and shorter:
- ⅛" thru ¼" diam, 25,000 to 200,000 pieces 61
- Over 200,000 pieces. 64
- 5/16" thru ½" diam: 15,000 to 100,000 pieces 61
- 100,000 or more ... 64

Longer than 3", any diam:
- 5000 to 100,000 pieces 61
- Over 100,000 pieces. 64

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1" diam x 6" and shorter 19
1" and smaller diam x over 6" ..... List

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6" or shorter:
- ¼" through ⅛" 34
- 5/16" & ⅜" & shorter.. 31
- ⅞", ½" through 1 in. 8

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.06	20.41
1¼	13	....	24.94	20.44
1½	13	23.31	27.57	22.60
1⅝	13	27.54	32.57	26.71
2	13	30.87	36.51	29.93
2¼	13	34.77	41.12	33.72
2½	12	37.73	44.63	36.59
2⅝	12	41.57	49.16	40.31
2¾	12	45.00	53.22	43.65
3	12	47.99	56.76	46.54

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.725	4.625	4.675	5.65
Ensley,Ala. T2	4.725	4.625	...	5.65
Fairfield,Ala. T2	....	....	....	5.65
Gary,Ind. U5	4.725	....	....	....
Huntington,W.Va. W7	....	....	....	5.65
IndianaHarbor,Ind. I-2	4.725	4.625	4.675	....
Johnstown,Pa. B2	....	....	...(16)	5.65
Lackawanna,N.Y. B2	4.725	4.625	...	5.65
Minnequa,Colo. C10	4.725	4.625	....	6.15
Steelton,Pa. B2	4.725	4.625	....	....
Williamsport,Pa. S19	....	....	....	5.65

TIE PLATES

Fairfield,Ala. T2	.....5.625
Gary,Ind. U5	.....5.625
Ind.Harbor,Ind. I-2	...5.625
Lackawanna,N.Y. B2	..5.625
Minnequa,Colo. C10	...5.625
Seattle B3	.....5.775
Steelton,Pa. B2	.....5.625
Torronce,Calif. C11	...5.775

TRACK BOLTS (20) Treated

Cleveland R2	.....12.40
KansasCity,Mo. S5	....12.40
Lebanon,Pa. B2	.....12.40
Minnequa,Colo. C10	..12.40
Pittsburgh O3, P14	....12.40
Seattle B3	.....12.90

AXLES

Ind.Harbor,Ind. S13	....7.25
Johnstown,Pa. B2	.....7.25

JOINT BARS

Bessemer,Pa. U5	.....5.825
Fairfield,Ala. T2	.....5.825
Ind.Harbor,Ind. I-2	...5.825
Joliet,Ill. U5	.....5.825
Lackawanna,N.Y. B2	..5.825
Minnequa,Colo. C10	...5.825
Steelton,Pa. B2	.....5.825

SCREW SPIKES

Cleveland R2	.....11.90
Pittsburgh O3	.....11.90

STANDARD TRACK SPIKES

Fairfield,Ala. T2	.....7.90
Ind.Harbor,Ind. I-2, Y1	7.90
KansasCity,Mo. S5	.....7.90
Lebanon,Pa. B2	.....7.90
Minnequa,Colo. C10	....7.90
Pittsburgh J5	.....7.90
Seattle B3	.....8.40
S.Chicago,Ill. R2	.....7.90
Struthers,O. Y1	.....7.90
Youngstown R2	.....7.90

METAL POWDER

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron: Cents
- 98+% Fe, annealed. 15.25
- Unannealed:
  - Minus 100 mesh 11.75
  - Minus 35 mesh 9.25
  - Minus 20 mesh 9.00

Swedish, c.i.f. N. Y., c.l., in bags 11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags 9.50
Canadian, f.o.b. shipping point 9.50
Electrolytic iron:
- Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in. 21.00
- Annealed, 99.5% Fe. 36.50
- Unannealed (99+% Fe) 32.50
- Unannealed (99+% Fe) (minus 325 mesh) 52.00

Powder Flakes (minus 16, plus 100 mesh).. 31.00
Carbonyl Iron:
- 97.9-99.8% size 5 to 10 microns..83.00-148.00

Aluminum:
- Atomized, 500 lb drums, frght. allowed
  - Carlots 32.20
  - Ton lots 34.20
- Antimony, 500 lb lots 32.00*
- Brass, 5000-lb lots .....39.00-49.00†
- Bronze, 5000-lb lots .....58.00-61.50†
- Copper:
  - Electrolytic 13.75*
  - Reduced 13.75*
- Lead 7.50*
- Manganese:
  - Minus 35 mesh 61.00
  - Minus 100 mesh 67.00
  - Minus 200 mesh 72.00
- Nickel, unannealed ... 94.00
- Nickel-Silver, 5000-lb lots .....53.25-60.00†
- Phosphor-Bronze, ¼-ton lots 58.50
- Silicon 43.50
- Solder 7.00*
- Stainless Steel, 302... 94.00
- Stainless Steel, 316... $1.25
- Tin 14.50*
- Zinc, 5000-lb lots 18.25-32.00‡
- Tungsten Dollars
  - Melting grade, 99% 60 to 200 mesh:
    - 1000 lb and over... 4.50
    - Less than 1000 lb. 4.65
- Chromium, electrolytic 99.2% Cr min. 3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago Base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(4) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Deld San Francisco Bay area.
(23) Mild plow, 10.55c.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.15c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.45c H.S.-L.A.
(31) Widths over ⅝-in.; 6.90c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.30c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25
Ambridge, Pa. N2	6.5	..	10.5	...	13	...	14.5	...	14.5	...	14	...	16.5	...
Lorain, O. N3	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25
Youngstown Y1	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled Carload discounts from list, %

Youngstown R2	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25

BUTTWELD STANDARD PIPE, Threaded and Coupled Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Alton, Ill. L1	...	...	....	....	....	....	15.5	+1.75	18.5	2.25	21	5.75	23.5	7
Benwood, W. Va. W10	16.5	+12	7.25	+18.25	+1.75	+26.25	17.5	0.25	20.5	4.75	23	7.75	25.5	7
Butler, Pa. F6	17.5	+11	9	+16.5	0.5	+24	...	...	...	...	...	...	...	...
Etna, Pa. N2	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Fairless Hills, Pa. N3	...	...	....	....	....	....	15.5	+1.75	18.5	2.75	21	5.75	23.5	7
Fontana, Calif. K1	...	...	....	....	....	....	6	+11.25	9	+7.25	11.5	+3.75	14	+2.5
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	16.5	+0.75	19.5	3.25	22	6.75	24.5	5
Lorain, O. N3	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Sharon, Pa. S4	17.5	+11	9	+16.5	0.5	+24	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Sparrows Pt., Md. B2	23	+ 5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Wheatland, Pa. W9	23	+ 5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1¼		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	26	10	26.5	10.5	28	10.75	28	10.75	....	...	....	...
Alton, Ill. L1	24	8	24.5	8.5	26	8.75	26	8.75	....	...	....	...
Benwood, W. Va. W10	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Etna, Pa. N2	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Fairless Hills, Pa. N3	24	8	24.5	8.5	26	8.75	26	8.75	16.5	+1.25	16.5	+1.25
Fontana, Calif. K1	14.5	+1.5	15	+1	16.5	+0.75	16.5	+0.75	7	+10.75	7	+10.75
Ind. Harbor, Ind. Y1	25	9	25.5	9.5	27	9.75	27	9.75	17.5	+0.25	17.5	+0.25
Lorain, O. N3	26	10	26.5	10.5	28	10.75	28	10.75	....	...	....	...
Sharon, Pa. M6	26	10	26.5	10.5	28	10.75	28	10.75	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Wire	Plates	Sheets	C.R. Strip; Flat Wire
201	17.00	21.50	....	....	31.00	....	....	42.25	39.00
202	18.25	24.00	31.00	36.25	33.50	36.75	38.75	42.50	42.50
301	17.75	22.25	....	36.75	32.00	38.00	....	44.25	41.00
302	19.00	24.75	32.00	37.25	34.50	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	38.25	40.25	47.00	47.00
303	....	26.75	34.75	40.00	....	41.00	....	....	....
304	20.25	26.00	33.75	39.00	37.25	40.25	43.00	47.25	47.25
304L	....	....	38.75	44.00	42.25	45.25	48.00	52.25	52.25
305	21.75	28.25	....	39.50	40.25	40.25	43.50	50.25	50.25
308	22.00	29.00	38.50	44.25	41.25	45.50	49.75	52.00	52.00
309	29.50	38.25	46.75	53.50	53.50	54.75	58.25	67.00	67.00
309S	31.50	41.00	51.00	59.00	58.50	60.25	63.75	74.00	74.00
310	37.25	48.00	62.25	72.25	66.50	73.50	75.25	78.75	78.75
314	....	....	....	....	....	....	75.25	....	....
316	31.50	40.25	51.25	59.50	58.25	60.75	64.00	68.25	68.25
316L	....	....	56.25	64.75	63.25	65.75	69.25	73.25	73.25
317	37.25	48.25	62.75	72.75	73.50	74.50	77.00	83.75	83.75
321	25.00	32.00	38.25	44.00	44.25	45.25	49.25	54.25	54.25
18-8CbTa	29.25	38.00	45.75	52.25	53.25	53.50	58.00	66.50	66.50
403	....	....	28.75	32.75	....	34.00	36.25	....	44.00
405	17.50	23.00	26.75	31.00	32.25	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	30.50	31.75	36.25	36.25
416	....	....	26.00	30.00	....	31.00	....	....	....
420	23.50	30.25	31.00	36.00	37.75	37.25	40.75	56.00	56.00
430	15.25	19.75	26.00	30.00	28.75	31.00	32.25	36.75	36.75
430F	....	....	26.50	30.50	....	31.50	....	....	....
431	16.00	20.50	26.50	30.50	29.75	31.50	33.00	38.00	38.00
446	....	....	35.50	40.50	53.25	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co., American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	30.50
304	30.30	36.05	32.50
304-L	32.30	37.95	....
310	41.30	47.00	....
316	35.50	41.40	47.00
316-L	40.00	46.10	....
316-CB	41.15	48.45	....
321	32.00	37.75	37.25
347	34.40	41.40	48.25
405	25.50	33.35	....
410	25.30	32.85	....
430	25.30	32.85	....
Inconel	49.45	65.45	....
Nickel	41.05	55.65	....
Nickel, Low Carbon	43.25	60.05	....
Monel	42.35	56.35	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled, 10%	Strip, Carbon Base, Cold Rolled, Both Sides
*Copper**	*30.00*	*38.00*

*Deoxidized. Production points: Stainless-clad sheets New Castle, Ind. I-4; stainless-clad plates, Claymont, Del C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular carbon	0.275	5%Cr Hot Work	0.430-0.480
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.090
18.25	4.25	1	4.75	...	2.305-2.475
18	4	2	9	...	2.675-2.6775
18	4	2	....	...	1.765
18	4	1	....	...	1.600
13.75	3.75	2	5	...	2.245
13.5	4	3	....	...	1.865
9	3.5	..	....	...	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.960

Tool steel producers include; A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	54.50	55.00‡	....	....
Birmingham R2	54.50	55.00‡	....	....
Birmingham U6	....	55.00‡	59.00	....
Woodward,Ala. W15	54.50	55.00‡	59.00	....
Cincinnati, deld.	....	62.70	....	....
Buffalo District				
Buffalo H1, R2	58.50	59.00	59.50	60.00
Tonawanda,N.Y. W12	58.50	59.00	59.50	60.00
N.Tonawanda,N.Y. T9	....	59.00	59.50	60.00
Boston, deld.	69.15	69.65	70.15	....
Rochester,N.Y. deld.	61.52	62.02	62.52	....
Syracuse,N.Y. deld.	62.62	63.12	63.62	....
Chicago District				
Chicago I-3	58.50	59.00	59.00	59.50
Gary,Ind. U5	58.50	....	59.00	....
S.Chicago R2	58.50	....	59.00	....
S.Chicago,Ill. Y1	58.50	59.00	59.00	59.50
S.Chicago,Ill. U5, W14	58.50	....	59.00	59.50
Milwaukee, deld.	60.67	61.17	61.17	61.67
Muskegon, Mich., deld.	....	65.30	65.30	....
Cleveland District				
Cleveland A7, R2	58.50	59.00	59.00	59.50
Akron,O., deld.	61.25	61.75	61.75	62.25
Lorain,O. N3	58.50	....	....	59.50
Mid-Atlantic District				
Bethlehem,Pa. B2	60.50	61.00	61.50	62.00
NewYork, deld.	....	64.78	65.28	....
Newark, deld.	63.52	64.02	64.52	65.02
Birdsboro,Pa. B10	60.50	61.00	61.50	62.00
Chester,Pa. C31	54.50	55.00	55.50	....
Philadelphia, deld.	56.16	56.66	57.16	....
Steelton,Pa. B2	60.50	61.00	61.50	62.00
Swedeland,Pa. A3	60.50	61.00	61.50	62.00
Philadelphia, deld.	62.16	62.66	63.16	63.66
Troy,N.Y. R2	60.50	61.00	61.50	62.00
Pittsburgh District				
NevilleIsland,Pa. P6	58.50	59.00	59.00	....
Pittsburgh (N&S sides), Aliquippa, deld.	....	60.37	60.37	60.87
McKeesRocks, deld.	....	60.04	60.04	60.54
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	60.66	60.66	61.16
Verona, Trafford, deld	60.69	61.19	61.19	61.69
Brackenridge, deld.	60.95	61.45	61.45	61.95
Bessemer,Pa. U5	58.50	....	59.00	59.50
Clairton,Rankin,S.Duquesne,Pa. U5	58.50	....	....	....
McKeesport,Pa. N3	58.50	....	....	59.50
Midland,Pa. C18	58.50	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	59.00	....
Sharpeville,Pa. S6	58.50	....	59.00	59.50
Youngstown Y1	....	....	59.00	59.50
Youngstown U5	58.50	....	....	59.50
Mansfield,O., deld.	63.40	....	63.90	64.40
Duluth I-3	58.50	59.00	59.00	59.50
Erie,Pa. I-3	58.50	59.00	59.00	59.50
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	64.50	65.00	....	....
Geneva,Utah C11	58.50	59.00	....	....
GraniteCity,Ill. G4	60.40	60.90	61.40	....
Ironton,Utah C11	58.50	59.00	....	....
LoneStar,Texas L6	....	55.00*	....	....
Minnequa,Colo. C10	60.50	61.00	61.50	....
Rockwood,Tenn. T3	....	55.00‡	59.00	....
Toledo,O. I-3	58.50	59.00	59.00	59.50
Cincinnati, deld.	64.26	64.76	....	....

*Phos. 0.51-0.75; $56, Phos. 0.31-0.50.
‡Intermediate (Phos. 0.31-0.69%), $56.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si to 18%; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$67.50
Buffalo H1	68.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls,N.Y. P15	$80.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	87.50
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	90.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035 max.)	$72.50
Steelton,Pa. B2 (Phos. 0.035 max.)	66.50
Philadelphia, deld.	70.05
Troy,N.Y. R2 (Phos. 0.035 max.)	66.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075 max.)	63.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075 max.)	63.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075 max.)	63.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 25 cents per 100 lb except: Buffalo, Cleveland, Erie, 30 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Birmingham, Chattanooga, Jackson, 15 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, 10 cents; Atlanta, Houston, Seattle, Spokane, no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††*		Carbon	Floor
Atlanta	7.14	8.20	8.87	....	7.40	...	7.42	9.39	....	7.63	7.49	9.48
Baltimore	7.03	8.32	9.10	....	7.65	...	7.61	8.62[9]	13.44	7.93	7.21	8.87
Birmingham	6.80	7.90	8.85	....	7.06	...	7.08	9.35	....	7.28	6.99	9.10
Boston	7.70	8.81	10.27	45.67	7.96	...	7.83	9.53	14.45	8.13	7.89	9.36
Buffalo	6.80	8.06	9.77	....	7.15	...	7.10	7.90	13.10	7.40	7.15	8.70
Chattanooga	6.95	8.10	8.60	....	7.20	...	7.20	9.18	....	7.45	7.25	9.05
Chicago	6.80	8.09	8.50	46.55	7.06	...	7.08	7.75	12.85	7.28	6.99	8.46
Cincinnati	6.92	8.08	8.90	46.10	7.30	...	7.32	8.05	13.09	7.75	7.28	8.71
Cleveland	6.80	8.09	8.85	....	7.16	...	7.14	7.85	12.91	7.61	7.16	8.63
Detroit	6.99	8.28	8.78	43.50	7.34	...	7.36	8.04	13.05	7.75	7.27	8.65
Erie, Pa.	6.80	7.90	8.85	....	7.15	...	7.08	7.85	....	7.40	7.15	8.63
Houston	7.85	8.75	10.49	....	8.15	...	8.25	9.85	14.00	8.20	7.80	9.20
Jackson, Miss.	7.10	8.20	9.20	....	7.40	...	7.40	9.44	....	7.60	7.45	9.30
Los Angeles	8.05	10.00	11.00	....	8.35	...	8.05	11.25	14.25	8.30	8.05	10.25
Milwaukee	6.89	8.18	8.59	....	7.15	...	7.17	7.94	12.94	7.45	7.08	8.55
Moline, Ill.	7.15	8.28	8.85	....	7.41	...	7.43	8.10	....	7.63	7.34	...
New York	7.46	8.68	9.44	44.95	8.07	...	7.96	9.48	13.28	7.99	7.76	9.19
Norfolk, Va.	7.25	...	...	....	7.65	...	7.65	9.50	....	7.95	7.45	8.95
Philadelphia	7.14	8.42	9.35	45.98	7.67	9.02	7.64	8.46	13.16	7.74	7.37	8.69**
Pittsburgh	6.80	8.09	9.20	47.67	7.16	...	7.08	7.85	12.85	7.28	6.99	8.46
Portland, Oreg.	7.80	8.80	10.65	....	8.00	...	7.95	11.80	15.00	7.85	7.75	9.60
Richmond, Va.	7.00	...	9.47	....	7.65	...	7.70	8.85	....	7.95	7.20	9.10
St. Louis	7.09	8.38	9.19	43.89	7.35	...	7.37	8.14	13.14	7.68	7.28	8.75
St. Paul	7.46	8.59	9.16	....	7.72	...	7.74	8.51	13.51	7.94	7.65	9.12
San Francisco	8.10	9.65	10.15	51.65	8.35	...	8.05	11.20	14.25[9]	8.25	8.05	10.25
Seattle	8.55	10.40	10.80	54.00	8.65	...	8.35	11.70	14.60	8.30	8.20	10.10
Spokane	8.55	11.00[7]	10.80	....	9.05	...	8.35	11.80	15.35	8.30	8.20	10.60
Washington	7.50	8.79	7.97	....	8.12	...	8.08	9.09	....	8.40	7.68	9.34

Prices do not include gage extras; †prices include gage and coating extras (based on 12.50-cent zinc), except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **¼-in. and heavier; ††as annealed; §§under ¼-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 5000 lb except in Chicago, New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [5]—500 to 9999 lb; [6]—400 to 999 lb; [4]—4000 lb and over; [8]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 to 3999 lb; [8]—2000 to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

SHIP BUILDING · SHIP REPAIRING · FOUNDERS · PROPELLERS · STRUCTURAL STEEL

AVONDALE MARINE WAYS, INC.

CABLE ADDRESS "AVONWAYS"

P. O. BOX 1030 · PHONE UNiversity 4561 · NEW ORLEANS 8, U. S. A.

Producers sugar coat the increases as they issue . . .

New Tin Mill Prices

TIN PLATE producers have a sweet coating for their price-increase pill. When new mill price bases go into effect on Oct. 1, users will find several extra charges are lower.

U. S. Steel Corp. has announced a hike of 40 cents per base box for electrolytic and hot-dipped tin plate, black plate and terne plate for the price period (it runs through Mar. 31, 1956). Special-coated manufacturing terne plate will go up 85 cents per base box.

Dividends—The extra on "differentially coated" tin plate will drop from 85 cents per base box to 65 cents. A $1.10 extra for tin plate with a coating equivalent to 1 lb per base box will be cut to $1. Significance: The increase purchasing agents will pay amounts to 20 and 30 cents per base box.

"We have gained more experience in working with electrolytic coatings in various densities, thus cutting our costs and passing along advantages to the consumers in form of a better product for low price," comments a Pittsburgh sales manager for a major producer. The initial cost of equipment had to be met when production of differentially coated tin plate was started.

How It's Made—Different current densities place a coating equivalent to a ¼-lb of tin per base box on one side of the steel and one equal to 1 lb on the other. Producers say this makes tin go farther. Cans have a thicker inside coating, where more protection is needed.

Producers expect the lower extra to be added inducement for users of hot-dipped tin plate to consider the advantages of the electrolytic product.

American Iron & Steel Institute statistics show how that process is growing: Output of electrolytic tin plate amounted to only 896,323 tons of a total of 2,709,651 tons of tin plate and short ternes produced in 1946. In 1954, production of tin plate, including short ternes, reached 4,987,563 tons. Of that total, 3,680,467 tons were electrolytic.

Growing Importance—About 180,000 tons of electrolytic was shipped with "differential coatings" in 1954, STEEL estimates. From 5 per cent of total electrolytic shipments last year, differentially coated has advanced to an estimated 8 per cent this year. Trade sources predict the gradual gain will continue.

Consumers are people who make cans for food products that need extra protection. About all canners of tomato juice use differentially coated. Other foods being packaged this way include pork and beans, citrus fruits and a growing list of vegetables.

Producers have their sights on a mammoth market. AISI reports an average family in this country uses 788 cans of all types each year. The figure was 486 in 1939, about 130 in 1900. Producers intend to keep tin can use on the upswing, with the help of developments like differentially coated.

In addition to reductions in coating extras for electrolytic tin plate, changes also are being made in extras on size differentials and for resquaring. Size differentials formerly covered width only; now, they include widths in two brackets of basis weights—70 lb and lighter and 75 lb and heavier. The change in size differentials results in higher prices in some cases, reductions in others, while in others there is no change. Resquaring will cost 40 cents more a base box.

Hot-Dipped Tin Plate—Coating extras are up 5 to 50 cents a base box, and extras on four of the heavier basis weights are increased 10 to 20 cents. Width differentials will be shown in two brackets instead of one; one bracket covers basis weights of 70 lb and lighter; the other, 75 lb and heavier. Resquaring extras are up 40 cents a base box. Quantity extras are raised 15 to 20 cents. In one instance, there's a reduction in the extra for packing charcoal plates.

Hot-Dipped Terne Plate—Coating extras are down 45 cents a base box; differentials on four of the heavier basis weights are up 10 to 20 cents; width differentials are revised; resquaring extras are up 40 cents a base box; and quantity extras are 15 to 20 cents higher.

Holloware Enameling Black Plate—Extras for width differentials are increased in some instances and lowered or left unchanged in others. On length extras, the bracket in which no charge is made is extended slightly. Resquaring extras are raised 40 cents; quantity extras are increased.

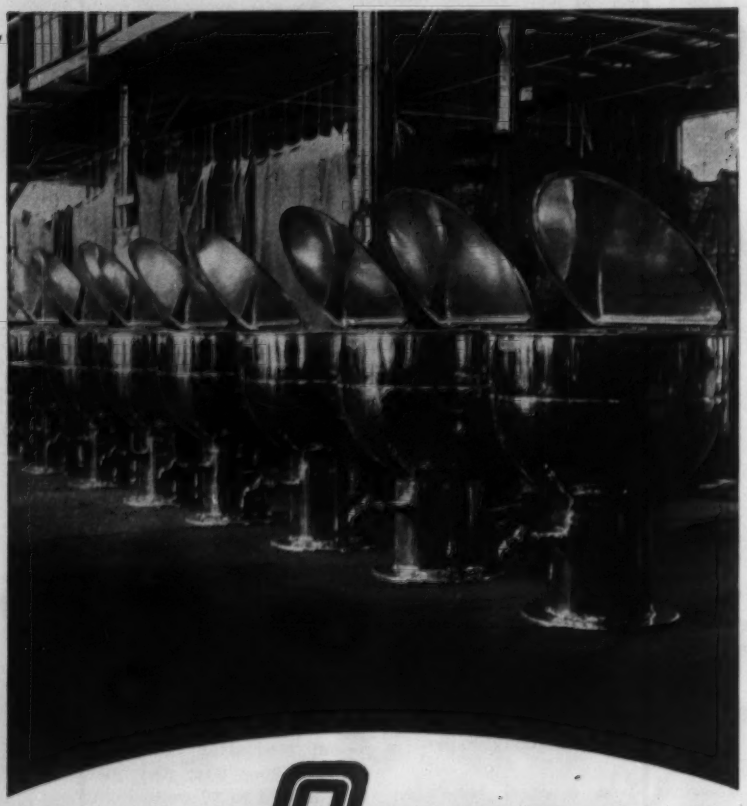
Black Plate — Width differentials are shown in two brackets—a basis weight of 70 lb and lighter and 75 lb and heavier. This results in an increase in some instances, no change in others and a reduction in others. The bracket in which no charge is made for length is extended slightly. Resquaring extras are up 40 cents a base box; quantity extras are raised.

Tin Plate . . .

Tin Plate Prices, Page 168

There is no shortage of tin plate. Tonnage movement is active as canmakers and other users press the mills for maximum shipments this month before the Oct. 1 price increase. Not all tin plate producers have announced price policy for the contracting period starting Oct. 1, but expectations are they will fol-

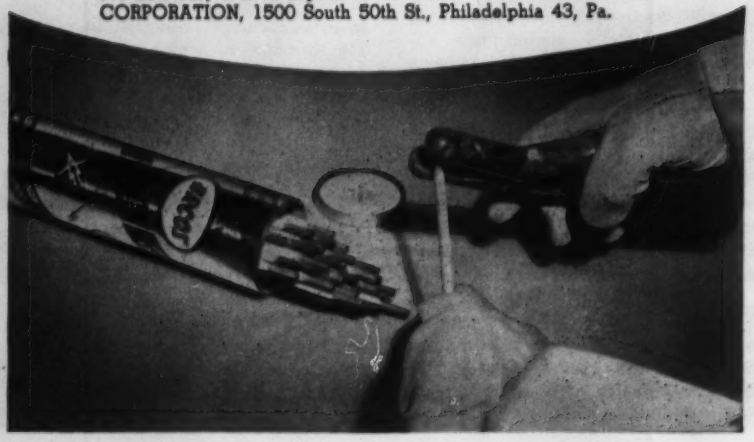
How to avoid costly trial and error when welding stainless



WELD WITH ARCOS

STAINLESS ELECTRODES

For truly *stainless* welds use ARCOS Electrodes. Trial and error electrode selection is risky when expensive equipment is involved—such as the food processing kettles pictured above. There's a complete line of ARCOS Electrodes—quality-controlled and ELECTROPAKED—to assure uniform performance in welding equipment that must withstand corrosive service. Try Arcos and see how easy it is to deposit sound welds—at low cost. ARCOS CORPORATION, 1500 South 50th St., Philadelphia 43, Pa.



low the lead of U. S. Steel Corp. which announced several weeks back.

Stainless Steel . . .

Stainless Steel Prices, Page 170

Carpenter Steel Co. has issued an up-to-date listing of sizes and shapes of stainless products rolled at its mill in Reading, Pa.

The guide for users includes: Forgings billets, in rounds, squares, hexagons and octagons, 1½ to 13 in., are available; hot-rolled bars in rounds ¼ to 5¾-in., in squares up to 4 in., in hexagons and octagons up to 2 in. and in rectangles up to 8 in. in width.

Forged bars are made in 13-in. rounds, squares and hexagons. They also are rolled in rectangles ranging from 2-in. wide x ¼-in. thick to 16-in. wide x 6-in. thick.

Cold-finished bars are rolled in rounds of ½ to 4 in., and in squares, hexagons and octagons up to 3 in.

Rectangular shapes range from ⅛ x ¼-in. to 4 x 2 in.

Hot-rolled strip is supplied in widths ⅜ to 10 in., and in minimum thicknesses of 0.120 to 0.220 in. Cold-rolled strip comes in sizes ranging from 3-1/16 to 9¾-in. wide; and in thicknesses 0.006 to 0.187 in.

Mill capacities apply to all standard analyses.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 167 & 168

Tight supply conditions will continue into the first quarter, 1956, in sheets and strip. Having long been sold out for the remainder of this year, sellers of carbon sheets are beginning to open books for shipments in the first three months of next year. All will have a large carry-over entering the new year. Some may have less than two months of production to offer for new tonnage orders in the period.

Demand is heavy for practically all grades, including electrical sheets and enameling stock. Certain mills already have tentatively accepted business in these latter grades for rolling late in the first quarter. First quarter ordering of stainless sheets is active. Carbon grades will be booked conservatively for the first quarter, however, until overdue volume on books is more clearly established. Demand for heavy gage hot-rolled carbon and galvanized sheets is bolstered by increasing requirements for 275-gallon household tanks and corrugated galvanized culvert pipe.

Auto builders are hurrying to get tonnage on mill order books with model change-overs under way. Au-

tomotive demand over the remainder of the year promises to be just about as heavy as it was in the second quarter.

Owing to recent price increases in copper, the Superior Steel Corp., Pittsburgh, has revised its base prices on copper clad strip produced at its Carnegie, Pa., plant. New prices are: Cold-rolled clad, 10 per cent both sides, $38 per 100 lb; cold-rolled clad, 10 per cent one side, $30.

The Stanley Works, New Britain, Conn., has revised thickness tolerance extras on cold-rolled strip and untempered spring steel in the carbon ranges, closer than standard, from 50 cents for up to 25 per cent restriction, to $2.50 up to 80 per cent.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 166

Some seasonal slackening is expected in building steel requirements, but, so far, pressure for reinforcing bar shipments is unabated. Requirements continue heavy, and deliveries, notably in New England, are more extended with supplies tight. Distributors, as a general thing, hold heavy order backlogs, which include some low-price tonnage taken in New England for bridges and highways.

Steel Bars . . .

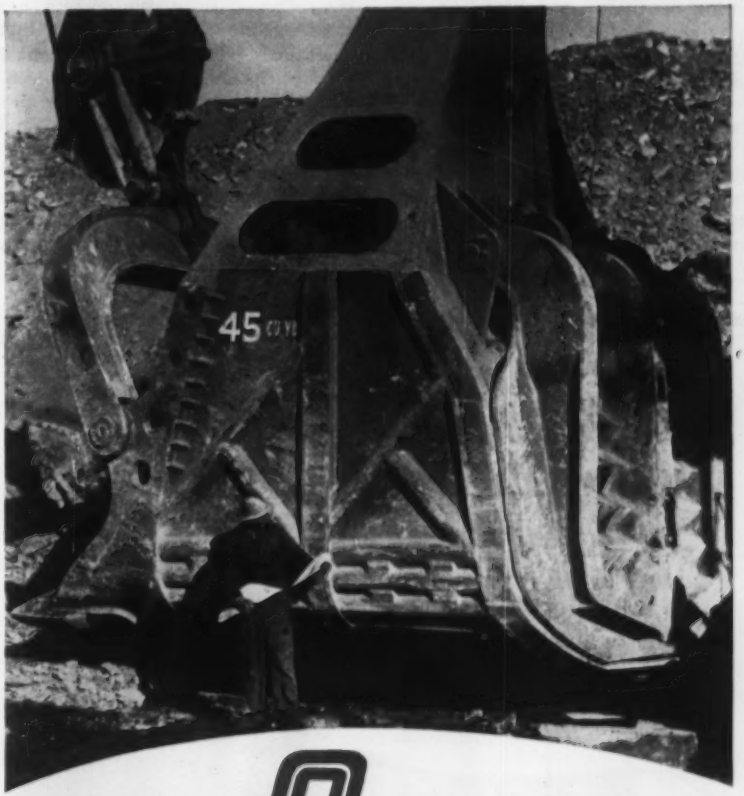
Bar Prices, Page 166

Little success is attending producers' efforts to cut down prospective shipment arrearages as the third quarter nears a close. Although some sellers of hot bars have blanked out at least one month of production in the fourth quarter to care for the anticipated overflow from the preceding three months, indications are the tonnage-carryover at year end will be as great as ever.

Few, if any, makers expect to have their order books in balance by Jan. 1. Still there is a tendency to overbook. One leading producer in the East is opening books for the first quarter on a month-to-month basis after having booked tonnage for the fourth quarter on a full three-month basis. The change in policy is designed to keep a closer check on commitments.

Consumption of bars is due for a boost in the Chicago area now that the 36-day strike at International Harvester plants has ended. The ban on raw materials intake has been lifted. Farm implement makers are important bar consumers. Implement plant strikes have disrupted the normal consumption pattern all summer. Demand for bars, both carbon and alloy, hot rolled and

A sure way to meet every demand when welding high strength steels



WELD WITH ARCOS

LOW HYDROGEN ELECTRODES

Low hydrogen electrodes are no "stepchild" at Arcos. They're manufactured under the same high standards as stainless—to meet exacting conditions. For example, welds in a dipper that will chew out 45 cu. yds. of stony soil in one bite must be strong, and must resist abrasion, shock and fatigue. Where strength is of primary importance, Arcos ELECTROPAKED Low Hydrogen Electrodes, frequently without preheat, are the "sure way" to get quality weld metal . . . . easily deposited every time. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

cold drawn, is also seen stimulated over coming weeks as new model automobiles hit assembly lines.

Carbon bar buyers in New England are trying to build up inventories, but they are having only indifferent success. Orders frequently are accepted by the mills on the basis of earlier consumption pattern. In some cases, inquiries are returned to customers, or held up. District sellers, however, say the rolling mills are closer to weekly estimated schedules and that shipments through the balance of the year are likely to top bookings.

Tubular Goods . . .

Tubular Goods Prices, Page 170

Tubular goods producers' order books are full for the fourth quarter. Consequently, tubemakers are stressing proper scheduling of mill operations. Production units must produce maximum tonnage if consumers' requirements are to be met. Currently, deliveries continue to run behind schedule.

Distributors and users report seamless pipe hard to obtain for fourth quarter delivery, especially large sizes. Mills aren't accepting many additional orders for the fourth quarter, except smaller sizes. Large seamless pipe is in heavy demand. Buttweld deliveries extend into late fourth quarter.

Plates . .

Plate Prices, Page 166

An eastern plate mill has just opened its books for first quarter orders. Another producer, out of the market for some time in an effort to balance rolling schedules, has just started to accept orders for November shipment. This latter interest, and at least two other mills in the East, may not start booking first quarter tonnage for another three or four weeks.

First quarter inquiries are increasing. Some producers are holding them tentatively; others are returning them to customers with the explanation that they have not opened books for the period. In New England users report producers still are booking carbon plates on a monthly shipment basis but that there is little space open in schedules for the remainder of this year.

Several thousand tons of plates, mostly hull steel, will be closed on this month by the Navy. Small tank and weldment requirements are reported heavier, fabricating shop operations in New England being sustained by arrival of delayed tonnage in some cases. Priority work, chiefly government needs, is getting needed steel.

The bulk of demand pressure in the Midwest appears to be coming from the heavy construction field, including tanks. The upward push in freight car construction, however, also is being reflected to an increasing extent.

While steel plates are scarce, there is no frenzy to cover needs noted among buyers, and no gray market trading of consequence is reported.

A. O. Smith Corp. has reduced operations at its Milwaukee pipe mill from two shifts to one because of a temporary shortage of plates.

Wire . . .

Wire Prices, Pages 168 & 169

Brisk demand continues for wire rods and manufacturers wire. Some mills are sold ahead 10 and 12 weeks. Merchant wire, however, is moving at a slower pace.

Openings for hard, drawn bright wire in fourth quarter schedules are reported narrowing in New England. Demand for cold-heading and spring wire is strong, and mill schedules are filled into December on more grades.

American
BROACHING
gives you
FLEXIBILITY
plus
HIGH OUTPUT

ANOTHER American FIRST

- 30 different universal joint yokes broached on one machine
- Broaching strokes from 48" to 72" used to broach parts
- Variable speeds—35 to 45 second cycle
- Two or four station operation
- Combination round and spline broaches
- Up to 400 parts per hour

Whether you need flexibility in broaching — to enable one machine to handle many parts — or volume production on a single part, American engineering will give you the combination of broaching machine, fixtures and broaches that will assure you maximum high output. To get American's recommendations, write today giving details of your broaching requirements —or ask for new Catalog 450.

American BROACH & MACHINE CO.
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

See American First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

Upholstery wire buying is active with coilmakers seeking to enlarge inventories.

Ferroalloys . . .

Ferroalloy Prices, Page 178

Upward price revisions on a number of ferroalloys were announced Sept. 14 by Electro Metallurgical Co., division of Union Carbide & Carbon Corp., New York. Increases were made effective at once on spot business and Oct. 1 on contracts. The weighted average increase amounts to 5.3 per cent.

This was the first general price revision by the company in some time. For example, with certain minor exceptions, silicon alloys have not been increased since 1950; manganese and chromium alloys, since 1952. Premiums for packing, sizing and quantity, also increased, have held steady since 1948.

Increases include: High carbon ferrochrome, 1.5 cents; low carbon ferrochrome, up to 50 per cent carbon, 2 cents; low carbon ferrochrome, 1.50 and 2 per cent maximum carbon, 1 cent; low carbon ferrochrome, all grades, 1.75 cents; chromium metal, 9 cents; ferrosilicon chrome, 2 cents; foundry ferrosilicon-chrome, 1 cent; exothermic ferrochrome and exothermic silicon-chrome, 2 cents; ferrochrome silicon, up to an amount equivalent to the increase in high carbon ferrochrome for chromium content, and equivalent to the increase in 50 per cent ferrosilicon for the silicon content, the material hereafter to be sold on the basis of chromium content only.

Among manganese alloys, medium carbon ferromanganese, ½-cent; low-iron ferromanganese, 2 cents; mansiloy alloy, 1 cent; 50 per cent ferrosilicon, ¾-cent; and the low aluminum grade, ¼-cent; silicomanganese, 2/10-cent. In the future, ferrosilicon and silicomanganese will be sold f.o.b. shipping point rather than delivered.

Increases on other silicon alloys are: 65 per cent ferrosilicon, 1 cent; low impurity 65 per cent ferrosilicon, ½-cent; 75 per cent ferrosilicon, 1 cent; 85 per cent ferrosilicon, 1 cent; 85 per cent ferrosilicon, low aluminum grade, 1.25 cents; 90 per cent ferrosilicon, 1.25 cents; 90 per cent ferrosilicon, low aluminum grade, 1.50 cents; all grades of silicon metal, 2 cents; ferroaluminum-silicon, 1.50 cents.

Among iron foundry alloys, silicon briquets are up 6/10-cent; silicomanganese briquets, ¼-cent; chromium briquets, 9/10-cent; ferromanganese briquets, ¼-cent; zirconium briquets, ½-cent; SMZ alloy and all grades of magnesium-ferrosilicon, 1 cent.

Price advances among the special alloys include: calcium-silicon, 1 cent; calcium-manganese-silicon, 1.5 cents; 35 to 40 per cent zirconium alloy, 1 cent; 12 to 15 per cent zirconium alloy, ½-cent; manganese-nickel-titanium, 15 cents a pound on all grades; ferrovanadium, 10 cents a pound.

Crushed sizes of all high carbon ferrochrome alloys are up about $3.50 a ton; crushed sizes of low carbon ferrochrome, about $7; crushed sizes of all grades of ferrosilicon, about $1 a net ton.

Higher differentials for packing, sizing and quantity apply. The increase in packing for all products sold both bulk and packed is about $5 a net ton. This does not apply to material sold packed only. Ton-lot and less-ton-lot quantity prices are increased $8 a ton.

Major products on which prices were not changed include: Standard ferromanganese; low carbon ferromanganese; electrolytic manganese metal; columbium and tungsten alloys.

SKY-THRILL
on the SCHUYLKILL
There's a new look in the skyline above Philadelphia's historic Schuylkill River. A solid but soaring look; graceful, enormously staunch, truly progressive. This bridge-span is a powerful part of the Schuylkill Expressway, designed to knit together fast-flowing traffic patterns of tomorrow, destined to be blessed by millions of time-saving motorists. Built by The Ingalls Iron Works Company, the bridge reflects just one of the numerous services offered by Ingalls for structural and shipbuilding applications all over the world today.
THE INGALLS
★ Fabricating Steel is our Business
IRON WORKS COMPANY
BIRMINGHAM, ALA. • PITTSBURGH, PA.
SALES OFFICES: Birmingham, New York, Chicago, Pittsburgh, Houston, New Orleans, Atlanta

Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk 21.85c per lb of contained Mn, packed, carload 22.9c, ton lot 24.5c, less ton 25.7c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max); Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.2c per lb of alloy. Packed, c.l. 12.2c, ton 12.65c, less ton 13.65c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 26.25c per lb of contained Cr; c.l. packed 27.5c, ton lot 29.25c, less ton 30.65c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 31.75c per lb contained Cr, 0.02 max 38.50c, 0.03 max 38c, 0.06 max 36.50c, 0.1 max 36c, 0.15 max 35.75c, 0.2 max 35.50c, 0.5 max 35.25c, 1.0 max 34c, 1.5 max 33.85c, 2.0 max 33.75c. Ton lot, add 3.1c, less ton add 4.8c. Carload packed add 1.45c. Delivered. Spot add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l. S M x D, bulk 27.4c per lb contained Cr. Packed c.l. 28.7c, ton 30.5c, less ton 32c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carloads, packed S M x D, 19.6c per lb of alloy, ton lot 20.85c; less ton lot, 22.05c, delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 39.05c per lb of contained Cr; 1" x down, bulk 39.8c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.2% min, Fe 0.2 max) Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.25 per lb, ton lots $1.27, less ton lots $1.28. Delivered. Spot add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.20. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, $1.33 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.75c per lb of contained Si. Packed, c.l. 13.85c, ton lot 15.3c, less ton 16.95c. F.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., and Portland, Oreg., Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.2c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 14.5c per pound contained silicon. Packed, c.l. 16.2c, ton lots, 18c; less ton, 19.35c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 15.4c per lb of contained Si. Packed c.l. 17.05c, ton lot 18.7c, less ton 19.95c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si. Packed, c.l. 19.95c, ton lot 21.35c, less ton 22.4c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 98% Si, 0.75% max Fe, 0.07 max Ca). C.l. lump, bulk, 20.5c per lb of Si. Packed, c.l. 21.95c, ton lot 23.25c, less ton 24.25c. Add 0.5c for max 0.03 Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lots packed 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 8.5c, per lb of alloy. Packed, c.l. 9.5c, ton lot 10.65c, less ton 11.5c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 26.25c per lb of alloy, ton lot 27.4c, less ton 28.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 22c per lb of alloy, carload packed 23.05c, ton lot 24.95c, less ton 25.95c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 21.5c per lb of alloy, carload packed 22.95c, ton lot 25.25c, less ton 26.75c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.95c per lb of briquet, carload packed in box pallets 17.15, in bags 17.85c; 3000 lb to c.l. in box pallets 18.35c; 2000 lb to c.l. in bags, 19.05c; less than 2000 lb in bags 19.95c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.1c per lb of briquet, c.l. packed, pallets 12.3c, bags 13.1c; 3000 lb to c.l., pallets, 13.5c; 2000 lb to c.l., bags, 14.3c, less ton 15.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.7c per lb of briquet, c.l. packed, pallets, 12.9c; bags 13.7c, 3000 lb to c.l., pallets, 14.1c; 2000 lb to c.l., bags, 14.9c; less ton 15.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.75c per lb of briquet; packed, pallets, 6.95c; bags, 7.75c; 3000 lb to c.l., pallet, 8.55c; 2000 lb to c.l. bags 9.35c; less ton 10.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2¼ lb and containing exactly 1 lb of Si). Carload, bulk 6.9c. Packed, pallets 7.1c; bags 7.9c; 3000 lb to c.l. pallets 8.7c; 2000 to c.l. bags 9.5c; less ton 10.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.45 per lb of contained W; 2000 lb W to 5000 lb W, $3.55; less than 2000 lb W, $3.67, delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.80-$6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min C 0.30% max). Ton lots, 2" x D, $4.65 per lb of contained Cb plus Ta, deld.; less ton lots $4.70.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, c.l. packed, ⅛" x 12 M, 18.5c per lb of alloy, ton lots 19.65c, less ton 20.9c. Deld. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18.5c per lb of alloy, ton lots 19.65c; less ton lots 20.9c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 17.2c per lb of alloy; ton lots 18.7c; less ton lots 19.95c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal, Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn. $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa. $1.24.

the trend is to THOMAS... for ANGLE BENDERS too!

here's why!

1. *All-steel* welded construction . . maximum strength with minimum floor-space required.
2. Furnished complete for leg-out or leg-in angle bending . . *no extras to buy!*
3. Quick roll adjustment for width of slot . . quicker change-over.
4. Special roll combinations available for beams, channels, flats, pipe, etc.
5. Usual Thomas ruggedness and dependability, as found in all Thomas metal-working machinery.

Power Adjustment Optional

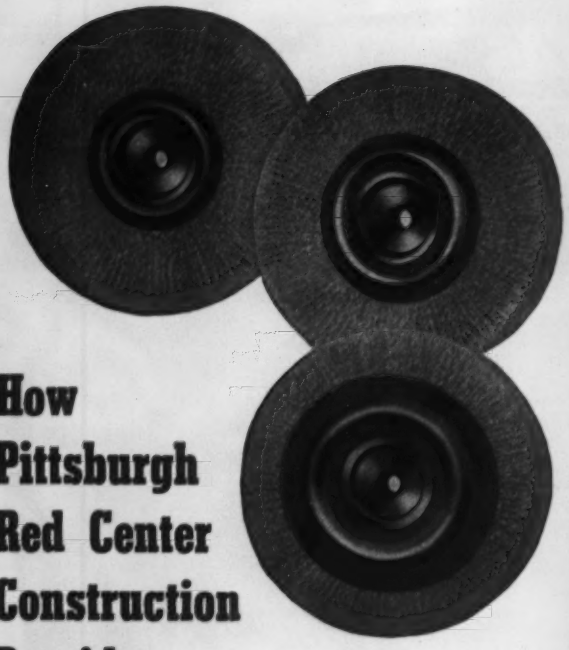
The Power Adjustment of the Movable Roll Shaft is an optional extra. It is used for quickly changing roll centers for different diameters. Machines also may be equipped with Electric Brake on the main driving motor for greater accuracy of bending.

Bulletin 314-A contains complete specifications and capacities covering the four sizes and two styles. Write.

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

38



How Pittsburgh Red Center Construction Provides

Faster cutting while maintaining smooth finish • Freedom from shedding • Perfect balance • Longer life

In conventional brushes, when faster cutting action is desired, coarser wire is used. But increasing the wire gauge causes brittleness, destroying the wearing quality of the brush, and resulting in excessive scoring of the work.

Pittsburgh has solved this problem by maintaining the same ideal gauge wire in every brush, but increasing the fill and diameter of the hub and center plate of brushes designed for faster cutting. Thus, although cutting speed is increased, work remains unscored and the wire does not lose its inherent power to flex. These Red Center brushes last longer, maintain perfect balance throughout life, and do a better job all around.

This is just one example of superior Pittsburgh construction, engineered for both general and specific applications. For details of the complete line, write for free Catalog #54-W. Address: PITTSBURGH PLATE GLASS CO., *Brush Div.*, Dept. O-9, 3221 Frederick Ave., Baltimore 29, Maryland.

PITTSBURGH

PG *Power Driven* **BRUSHES**

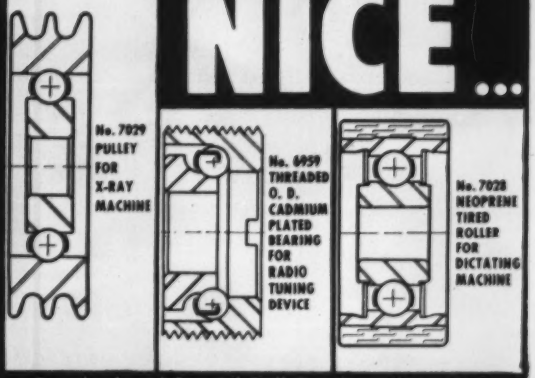
BRUSHES • PAINTS • GLASS • CHEMICALS • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

Have you investigated the design and cost saving opportunities offered by

NICE...


No. 7029 PULLEY FOR X-RAY MACHINE
No. 6959 THREADED O. D. CADMIUM PLATED BEARING FOR RADIO TUNING DEVICE
No. 7028 NEOPRENE TIRED ROLLER FOR DICTATING MACHINE

Standard and Special Ball Bearings Since 1902

Write for Cat. No. 150

NICE

NICE BALL BEARING CO.

NICETOWN • PHILADELPHIA • PENNSYLVANIA

STEEL TUBING

SEAMLESS or WELDED
AIRCRAFT • MECHANICAL
PRESSURE • STAINLESS
STAINLESS PIPE & FITTINGS

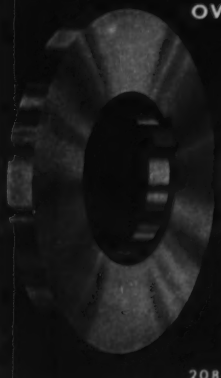
SERVICE STEEL

DETROIT • BUFFALO • CHICAGO • CINCINNATI • LOS ANGELES

COWLES

GANG SLITTING KNIVES

OVER 30 YEARS EXPERIENCE



Standard for Service and Durability. Ground to extremely close Tolerances and Finish. Made by *Toolmakers.*

COWLES TOOL COMPANY

2086 W. 110th ST. CLEVELAND 2, OHIO

Ores

Lake Superior Iron Ore
(Prices effective for the 1955 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore
Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore
Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore
Net ton unit, before duty

Foreign, wolframite, good commercial quality	$33.50
Domestic, scheelite, mine	63.00

Manganese Ore
Mn 48%, nearby, 95c-$1.05 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore
Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $45.00-$50.00
48% 3:1	42.00-44.00
48% no ratio	34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	32.00

Domestic
Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore
Per unit of Sb content, c.i.f. seaboard

56-60%	$3.50-$3.75
60-65%	3.75-3.90

Vanadium Ore
Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)
High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $122; Salina, Pa., $127; Niles, O., $133.
Super-Duty: St. Louis, $150.

Silica Brick (per 1000)
Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., Hawston, Pa., $128; Warren, Niles, O., Hays, Pa., $133; Morrisville, Pa., $131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $138; Lehigh, Utah, $144; Los Angeles, $151.
Super Duty: Hays, Sproul, Hawston, Pa., Warren, Windham, O., Athens, Tex., $145; Morrisville, Pa., Niles, O., $148; Joliet, Ill., $151; Curtner, Calif., $163.

Semisilica Brick (per 1000)
Clearfield, Pa., $139; Philadelphia, $125; Woodbridge, N. J., $122.

Insulating Fire Brick (per 1000)
2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)
Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $88.50; Wellsville, O., $92.50; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)
50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $194; Danville, Ill., $197.
60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $241; Danville, Ill., $244.
70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $279; Danville, Ill., $281; Clearfield, Pa., $286.

Sleeves (per 1000)
Reesdale, Johnstown, Bridgeburg, Pa., $157; Clearfield, Pa., $158.50; St. Louis, $169.30.

Nozzles (per 1000)
Reesdale, Pa., $253.70; Johnstown, Pa., $259.20; Clearfield, Pa., $259.40; St. Louis, $259.45; Bridgeburg, Pa., $286.

Runners (per 1000)
Reesdale, Johnstown, Bridgeburg, Pa., $196; Clearfield, Pa., $198; St. Louis, $195.80.

Dolomite (per net ton)
Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding, Bonne Terre, Mo., $14.

Magnesite (per net ton)
Domestic, dead-burned, bulk, ¼-in. grains with fines: Chewelah, Wash., $40; Luning, Nev., $40. ⅝-in. grains with fines: Baltimore, $66.40.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.25-$14.00
Connellsville, foundry	16.00-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$25.50
Camden, N. J., ovens	25.00
Everett, Mass., ovens	
New England, deld.	*27.05
Chicago, ovens	25.75
Chicago, deld.	27.25
Terre Haute, Ind., ovens	25.50
Milwaukee, ovens	26.25
Indianapolis, ovens	25.50
Portsmouth, O., ovens	24.75
Cincinnati, deld.	27.34
Painesville, O., ovens	26.25
Cleveland, deld.	28.18
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.75
Buffalo, deld.	27.00
Lone Star, Tex., ovens	19.50
Neville Island, Pa., ovens	25.00
Philadelphia, ovens	25.00
Swedeland, Pa., ovens	25.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	25.00
Detroit, ovens	26.25
Detroit, deld.	27.25
Pontiac, deld.	27.81
Saginaw, deld.	29.33

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Ammonium sulphate	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point
Phenol: Grade 1, 14.00; Grade 2-3, 13.50; Grade 4, 15.50; Grade 5, 14.25.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-$39; 70%, $35-$36; 60%, $31-$32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam (Inches)	Length (Inches)	Per 100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5¼	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25

CARBON

8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

WARD STEEL CO.

We specialize in FINISHED STEEL BARS—TUBES—STRIP

PROMPT WAREHOUSE SERVICE ONLY

Most Complete Stock in America of BLUE TEMPERED SPRING STEEL

We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand.

87A Rindge Ave. Ext. Phone UN 4-2460
CAMBRIDGE 40, MASS.

Branches
3042-3058 W. 51st Street, CHICAGO, ILL.
Phone Grove Hill 6-2600

Fenner Street, Providence, R. I.
Phone Gaspee 1-5573, 1-8573

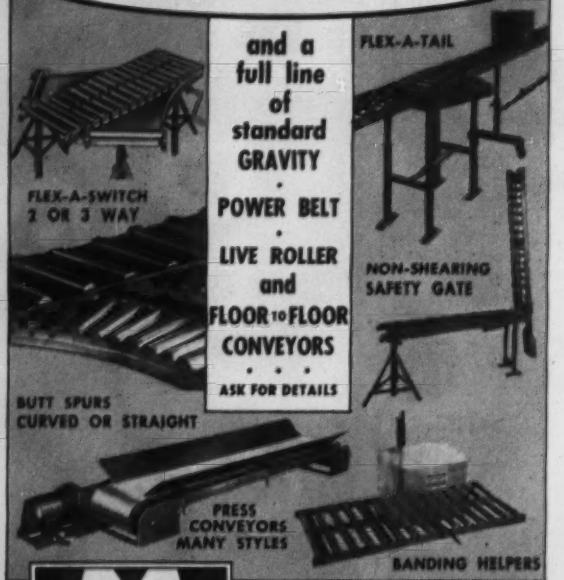
METZGAR

CONVEYOR SPECIALTIES

and a full line of standard GRAVITY • POWER BELT • LIVE ROLLER and FLOOR TO FLOOR CONVEYORS

• • •

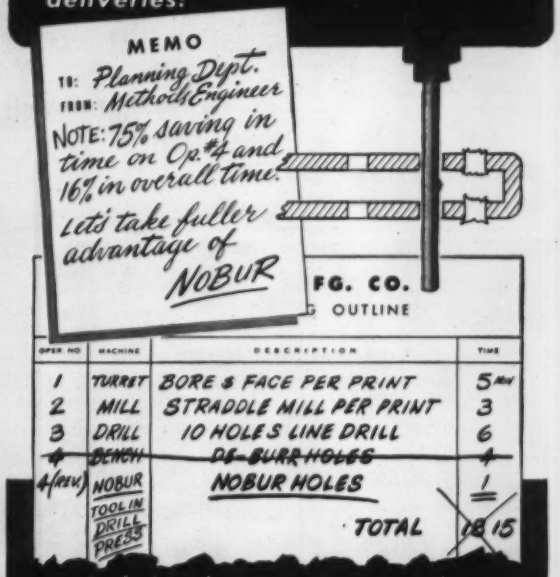
ASK FOR DETAILS



METZGAR CONVEYOR CO.

409 Douglas St., N.W., GRAND RAPIDS 4, MICHIGAN

Deburring with NOBUR tool on drill press reduces production costs . . . speeds deliveries!


MEMO
TO: Planning Dept.
FROM: Methods Engineer
NOTE: 75% saving in time on Op. #4 and 16% in overall time.
Let's take fuller advantage of NOBUR
FG. CO.
OUTLINE
OPER. NO | MACHINE | DESCRIPTION | TIME
1 | TURRET | BORE & FACE PER PRINT | 5 Min
2 | MILL | STRADDLE MILL PER PRINT | 3
3 | DRILL | 10 HOLES LINE DRILL | 6
4 | BENCH | DE-BURR HOLES | 4
4 (new) | NOBUR TOOL IN DRILL PRESS | NOBUR HOLES | 1
TOTAL 18 15

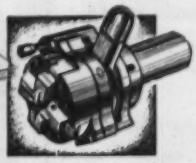
For further information, write or wire today

NOBUR MANUFACTURING COMPANY

6860 Farmdale Ave. • No. Hollywood, California

H&G Insert Chaser DIE HEADS

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.



THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: A. C. Berbringer, Inc., 334 N. San Pedro St., Los. Angeles, California. Canada: F. F. Barber Machinery Co., Toronto, Canada.

VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland) OHIO

INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS

By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages — 4 tables
69 illustrations — Price $5.00 Postpaid

THE PENTON PUBLISHING CO.

Book Department, 1213 W. 3rd St., Cleveland 13, O.

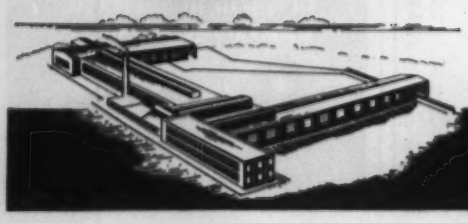
KEYSTONE

Better Bar Steel Service

COLD FINISHED STEEL

CARBON • ALLOY • LEADED

ROUNDS • SQUARES • HEXAGONS • FLAT



Serving the METAL WORKING INDUSTRY for over a Quarter Century.

Your inquiry will receive prompt attention.

KEYSTONE DRAWN STEEL CO.

SPRING CITY PENNSYLVANIA

Scrap . . .

Scrap Prices, Page 184

Pittsburgh—The lull in buying of No. 1 heavy melting scrap continues. Some brokers think the mills have waited too long to place orders, in view of anticipated near-capacity operations in the fourth quarter. One of the largest consumers is about to re-enter the market.

Continued increases in all but cast iron grades indicate the strength of the market. Machine shop turnings and short shovel turnings are up $1. Purchasers of cut structurals in 3-ft lengths are paying $50 a ton, $1 above last week. Sales of cast iron grades were slow last week.

Boston—No. 2 heavy melting steel and bundles are slightly firmer—up $1 a ton on some new buying, with shipments of steel scrap against old orders about completed. Cast iron scrap demand is for small shipments, with prices gathering no additional strength.

New York—Brokers' buying prices on carbon steel and cast iron grades of scrap are unchanged. But those on 18-8 stainless are higher at $280-$285 for sheets, clips and solids; $150-$160 for borings and turnings.

Buffalo—Steady tendencies prevail in the scrap market after the surprising $1 per ton decline posted a week ago.

Philadelphia—Prices on steel scrap are steady and strong. The trade is watching the Fairless, Pa., consumer for a possible clue as to the market trend over the next couple of weeks. Earlier this month, this buyer closed on 15,000 tons of No. 2 bundles at $39, delivered, which was a couple dollars over the going market at that time.

Cincinnati—The scrap market here is steady, except for low phos, which is quoted $1 higher at $47-$48.

Chicago—The market tone continues strong here even though consumers are limiting their purchases to deter price increases. The strength is observed more in broker-dealer transactions than in consumer acquisitions, and unwillingness of brokers to sell at former prices. Machine shop turnings have sold $2 higher at $30 a ton, but other grades of turnings and borings hold unchanged.

Cleveland—Strength is building up in the scrap market despite the absence of large buying. Minor strikes in the area have curtailed scrap production beyond expectations. Suspensions for automobile model changes also have cut the flow of material. Last week a sale in the Valley of No. 1 busheling substantiated the $46-$47 range quoted on that grade. A sale of shovel turnings to a northern Ohio mill confirmed the quoted range of $27.50-$28.50 on that classification.

Detroit — Scrap prices are unchanged here, with the market on even keel. No change is expected until auto lists come out.

Birmingham—Higher prices recently effected here have brought out larger supplies of open-hearth and cast scrap.

Los Angeles — Dealers anticipate price increases within a month. Buoyant market sentiment has caused something of a buying flurry among mills seeking to build inventories.

San Francisco—Steel scrap prices are tending upward. Unofficial quotations are $2 to $3 a ton above the currently recognized market.

Seattle—The scrap market is firm. Receipts are heavy, and consumption is above that at this time a year ago.

Pig Iron . . .

Pig Iron Prices, Page 171

A mild but steady gain is noted in pig iron buying. Most sellers are confident that this trend will continue into November, barring possibly a few minor fluctuations.

Prospects are that fourth quarter business will be significantly better than that for the third quarter. Inventory adjustments, following the summer lull, and strikes in farm implement plants have been deterrents. Operations at International Harvester plants have been resumed and "hold-up" orders on shipments of materials have been canceled.

Impetus to foundry melts is coming mainly from automotive foundries as the swing to new model assemblies progresses.

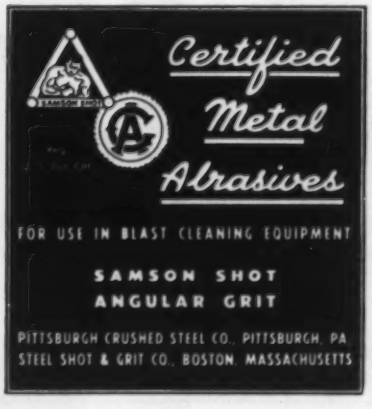
The Chester, Pa., furnace has opened books for the entire fourth quarter.

Little, if any, pig iron is com' g

(*Please turn to page* 186)

Your machining department for hardened and precision ground screw machine products. Send for brochure & equipment list.
Ottawa
OTTAWA STEEL PRODUCTS INC.
Grand Haven Michigan
OTTAWA STEEL PRODUCTS OSP INC.

they all know the best place in Cleveland
"Hotel Cleveland, sir?"
Whether you arrive by train, plane or car, the friendliest place to stay is Hotel Cleveland, directly connected with Union Terminal.
No room charge for children under 14 when registered with an adult.
Hotel Cleveland
SONNABEND OPERATED HOTELS
Distinguished American Landmarks
CHICAGO: Edgewater Beach Hotel
BOSTON: Hotel Somerset
NEW YORK CITY: Ritz Tower Hotel
CLEVELAND: Hotel Cleveland


Certified Metal Abrasives
FOR USE IN BLAST CLEANING EQUIPMENT
SAMSON SHOT
ANGULAR GRIT
PITTSBURGH CRUSHED STEEL CO., PITTSBURGH, PA.
STEEL SHOT & GRIT CO., BOSTON, MASSACHUSETTS

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Sept. 21	$44.33
Sept. 14	44.33
Aug. Avg.	43.97
Sept. 1954	29.94
Sept. 1950	40.93

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting..	43.00-44.00
No. 2 heavy melting..	39.00-40.00
No. 1 bundles	43.00-44.00
No. 2 bundles	35.00-36.00
No. 1 busheling	43.00-44.00
Machine shop turnings	*29.00-30.00*
Mixed borings, turnings	*29.00-30.00*
Short shovel turnings..	32.00-33.00
Cast iron borings	32.00-33.00
Cut structurals, 3 ft lengths	*49.00-50.00*
Heavy turnings	42.00-43.00
Punchings & plate scrap	*49.00-50.00*
Electric furnace bundles	*48.00-49.00*

Cast Iron Grades

No. 1 cupola	*41.00-42.00*
Charging box cast	*37.00-38.00*
Heavy breakable cast	*37.00-38.00*
Unstripped motor blocks	29.00-30.00
No. 1 machinery cast	*45.00-46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00
Rails, 2 ft and under..	54.00-55.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths..	51.00-52.00
Railroad specialties....	53.00-54.00

Stainless Steel Scrap

18-8 bundles & solids..	265.00-275.00
18-8 turnings	120.00-130.00
430 bundles & solids..	100.00-105.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer's plant)

No. 1 heavy melting..	43.50-44.50
No. 2 heavy melting..	32.00-33.00
No. 1 bundles	43.50-44.50
No. 2 bundles	29.00-30.00
No. 1 busheling	43.50-44.50
Machine shop turnings	23.00-24.00
Mixed borings, turnings	27.50-28.50
Short shovel turnings..	27.50-28.50
Cast iron borings	27.50-28.50
Low phos.	45.00-46.00
Cut structural plates 2 ft and under	47.00-48.00
Alloy free, short shovel turnings	31.00-32.00
Electric furnace bundles	43.50-44.50

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	40.00-41.00
Stove plate	46.00-47.00
Heavy breakable cast..	37.00-38.00
Unstripped motor blocks	29.00-30.00
Brake shoes	35.00-36.00
Clean auto cast	48.00-49.00
Burnt cast	37.00-38.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
R.R. malleable	51.00-52.00
Rails, 2 ft and under..	56.00-57.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths..	50.00-51.00
Cast steel	46.00-47.00
Railroad specialties....	52.00-53.00
Uncut tires	47.00-48.00
Angles, splice bars	53.50-54.50
Rails, rerolling	60.00-61.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids..	275.00-280.00
18-8 turnings	130.00-140.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer's plant)

No. 1 heavy melting..	46.00-47.00
No. 2 heavy melting..	35.00-36.00
No. 1 bundles	46.00-47.00
No. 2 bundles	32.00-33.00
No. 1 busheling	46.00-47.00
Machine shop turnings.	24.00-25.00
Short shovel turnings..	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	46.00-47.00
Electric furnace bundles	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00

CHICAGO

No. 1 heavy melting...	42.00-44.00
No. 2 heavy melting...	34.00-35.00
No. 1 factory bundles	44.00-45.00
No. 1 dealer bundles..	41.00-42.00
No. 2 bundles	31.00-32.00
No. 1 busheling	42.00-44.00
Machine shop turnings	*29.00-30.00*
Mixed borings, turnings	29.00-30.00
Short shovel turnings ..	29.00-30.00
Cast iron borings	29.00-30.00
Cut structurals, 3 ft ..	45.00-46.00
Punchings & plate scrap	46.00-47.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Stove plate	37.00-38.00
Unstripped motor blocks	34.00-35.00
Clean auto cast	51.00-52.00
Drop broken machinery	51.00-52.000

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00
R.R. malleable	52.00-53.00
Rails, 2 ft and under..	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Angles, splice bars	53.00-54.00
Rails, rerolling	64.00-65.00

Stainless Steel Scrap

18-8 bundles & solids	*200.00-300.00*
18-8 turnings	*160.00-170.00*
430 bundles & solids...	100.00-105.00
430 turnings	45.00-50.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	40.00
No. 2 heavy melting..	30.00
No. 1 bundles	40.00
No. 2 bundles	29.00
No. 1 busheling	40.00
Machine shop turnings	22.50
Mixed borings, turnings	22.50
Short shovel turnings	25.50
Punchings & plate scrap	45.50

Cast Iron Grades

Charging box cast	32.00
No. 1 cupola	39.00
Stove plate	32.00
Heavy breakable	32.00
Unstripped motor blocks	22.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting...	36.00-37.00
No. 2 heavy melting...	32.00-33.00
No. 1 bundles	36.00-37.00
No. 2 bundles	28.00-29.00
No. 1 busheling	36.00-37.00
Cast iron borings	17.00-18.00
Short shovel turnings..	26.00-27.00
Machine shop turnings.	23.00-24.00
Electric furnace bundles	37.00-38.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	47.50-48.00
Stove plate	44.50-45.50
Bar crops and plate...	42.00-43.00
Structural plate, 2 ft...	41.00-42.00
Unstripped motor blocks	36.00-37.00
Charging box cast	28.00-29.00
No. 1 wheels	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	42.00-43.00
Rails, 2 ft and under..	44.00-45.00
Rails, 18 in. and under	*54.00-55.00*
Rails, rerolling	53.00-54.00
Rails, random lengths	*50.00-51.00*
Angles, splice bars	50.00-51.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting...	46.00-47.00
No. 2 heavy melting...	40.00-41.00
No. 1 bundles	46.00-47.00
No. 2 bundles	37.00-39.00
No. 1 busheling	46.00-47.00
Electric furnace bundles	47.50
Machine shop turnings.	28.00-28.50
Mixed borings, turnings	27.00-28.00
Short shovel turnings ..	30.50-31.00
Structurals & plate ...	49.00
Heavy turnings	42.00
Couplers, springs, wheels	51.00
Rail crops, 2 ft & under	58.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Malleable	57.00-58.00
Heavy breakable cast..	45.00-46.00
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting..	40.50-41.50
No. 2 heavy melting..	37.00-38.00
No. 1 bundles	40.50-41.50
No. 2 bundles	31.00-32.00
Machine shop turnings.	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings..	22.00-23.00
Low phos. (structural & plate)	42.00

Cast Iron Grades

No. 1 cupola	34.50
Unstripped motor blocks	25.00-26.00
Heavy breakable	38.00-39.00

Stainless Steel

18-8 sheets, clips, solids	*280.00-285.00*
18-8 borings, turnings	*150.00-160.00*
430 sheets, clips, solids	115.00-120.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	36.00-37.00
No. 2 heavy melting...	29.50-30.50
No. 1 bundles	35.50-36.50
No. 2 bundles	26.00-27.00
Machine shop turnings.	18.50-19.00
Mixed borings, turnings	21.50-22.00
Short shovel turnings..	22.50-23.00
No. 1 cast	30.00-31.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast.	35.00-36.00

BUFFALO

No. 1 heavy melting...	38.00-39.00
No. 2 heavy melting..	35.00-36.00
No. 1 bundles	38.00-39.00
No. 2 bundles	32.00-33.00
No. 1 busheling	38.00-39.00
Mixed borings, turnings	28.00-29.00
Machine shop turnings.	26.00-27.00
Short shovel turnings..	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	45.00-46.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	40.00-41.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths.	47.00-48.00
Rails, 2 ft and under.	51.00-52.00
Railroad specialties....	48.00-49.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting ..	40.0041.00
No. 2 heavy melting..	34.00-35.00
No. 1 bundles	40.0041.00
No. 2 bundles	31.00-32.00
No. 1 busheling	40.00-41.00
Machine shop turnings.	26.00-27.00
Mixed borings, turnings	23.00-24.00
Short shovel turnings..	29.00-30.00
Cast iron borings	23.00-24.50
Low phos., 18 in.	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast..	38.00-39.00
Charging box cast	38.00-39.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt	43.00-44.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths..	49.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting..	36.50
No. 2 heavy melting..	34.00
No. 1 bundles	36.50
No. 2 bundles	29.50
Machine shop turnings.	26.00
Short shovel turnings..	27.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	39.00
Heavy breakable cast..	36.00
Unstripped motor blocks	35.00
Brake shoes	36.00
Clean auto cast	46.00
Stove plate	37.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00
Rails, 18 in. and under	55.00
Rails, random length..	48.00
Rails, rerolling	63.00
Angles, splice bars	50.50

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting...	35.00
No. 2 heavy melting...	31.00
No. 1 bundles	28.00
No. 2 bundles	23.00
No. 3 bundles	19.00
Machine shop turnings.	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings..	15.00-16.00
Electric furnace, No. 1.	42.00-44.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	35.00
Heavy breakable cast..	30.00
Unstripped motor blocks	29.00
No. 1 wheels	35.00
Stove plate (f.o.b. plant)	25.00
Brake shoes	28.00-29.00

Railroad Scrap (Delivered consumer's plant)

Rails, random lengths..	33.00

LOS ANGELES

No. 1 heavy melting..	32.00
No. 2 heavy melting..	30.00
No. 1 bundles	32.00
No. 2 bundles	25.00
Machine shop turnings.	10.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	43.00-45.00

SAN FRANCISCO

No. 1 heavy melting..	34.00
No. 2 heavy melting..	32.00
No. 1 bundles	34.00
No. 2 bundles	29.00
No. 1 busheling	34.00
Machine shop turnings.	14.00
Mixed borings, turnings	14.00
Short shovel turnings..	16.00
Cast iron borings	16.00
Cut structurals	36.00
Heavy turnings	14.00
Punchings & plate scrap	34.00

Cast Iron Grades

No. 1 cupola	42.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

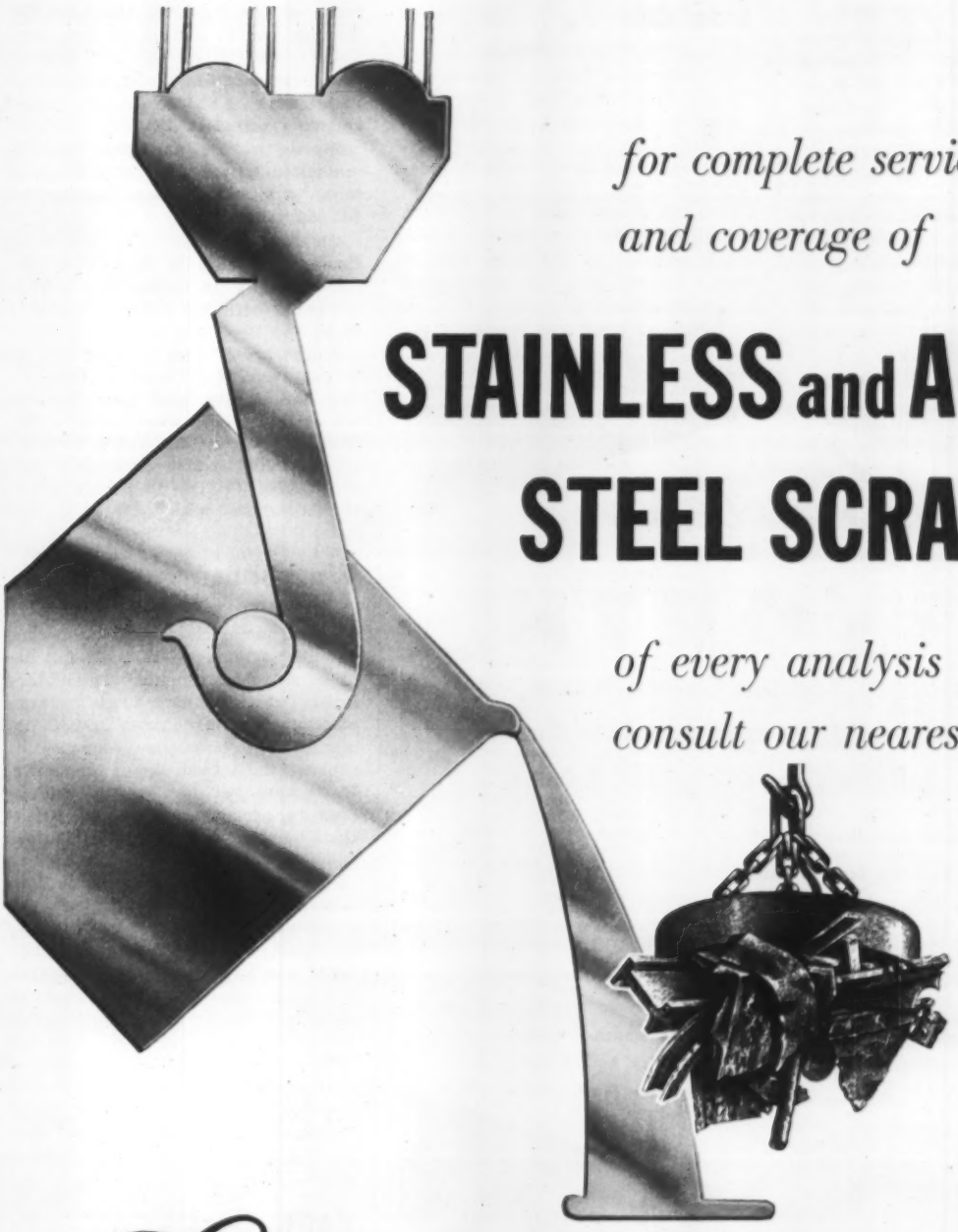
(Delivered prices)

No. 1 heavy melting..	38.50
No. 2 heavy melting..	35.50
No. 1 bundles	38.50
No. 2 bundles	32.50
Mixed steel scrap	32.50
Mixed borings, turnings	17.00
Rails, remelting	47.50
Busheling, new factory: Prepared	36.50
Unprepared	32.50
Short steel turnings ..	21.00

Cast Iron Grades†

No. 1 machinery cast..	42.00-45.00

†F.o.b., shipping point.



for complete service
and coverage of

STAINLESS and ALLOY STEEL SCRAP

of every analysis
consult our nearest office.

Luria Brothers and Company, Inc.

main office **PHILADELPHIA NATIONAL BANK BUILDING,** *Phila. 7, Pa.*

PLANTS

LEBANON, PENNA. — DETROIT (ECORSE), MICHIGAN
READING, PENNA. — PITTSBURGH, PENNA.
MODENA, PENNA. — ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA. — CLEVELAND, OHIO — LOS ANGELES, CAL. — READING, PENNA.
BOSTON, MASS. — DETROIT, MICHIGAN — NEW YORK, N. Y. — ST. LOUIS, MISSOURI
BUFFALO, N. Y. — HOUSTON, TEXAS — PITTSBURGH, PENNA. — SAN FRANCISCO, CAL.
CHICAGO, ILLINOIS — LEBANON, PENNA. — PUEBLO, COLORADO — SEATTLE, WASH.
MONTREAL, CANADA

IMPORT & EXPORT — **LIVINGSTON & SOUTHARD, INC.,** 99 Park Ave., New York, N. Y. • *Cable Address:* **FORENTRACO**

(*Concluded from page 183*)

in from abroad—nor is any being exported. Sellers have received an occasional inquiry for export.

Pig iron production in August totaled 6,529,580 tons, bringing output for the first eight months to 50,027,467 tons, says the American Iron & Steel Institute. Ferromanganese and spiegeleisen production amounted to 71,902 tons last month and 488,787 tons for the first eight months. Over-all production was 6,601,482 tons in August and 50,476,254 tons for the first eight months.

Iron Ore . . .

Iron Ore Prices, Page 181

Shipments of iron ore down the Great Lakes in the week ended Sept. 19 totaled 2,901,862 gross tons, reports the Lake Superior Iron Ore Association. This brought the cumulative movement for the 1955 season to 62,702,625 tons, which is about 15 million tons above the tonnage movement reported to the same date in 1954, and only about 12 million tons under the record 1953 rate.

Consumption of Lake Superior ore in August amounted to 7,484,775 tons, up sharply from the 4,894,874 tons used in the like month last year. Total consumption through August this year was 57,866,086 tons, compared with 44,822,658 in the corresponding period of 1954.

Stocks of ore on hand Sept. 1 amounted to only 39,505,818 gross tons. A year ago stocks totaled 45,732,804 tons.

On Sept. 1 there were 189 blast furnaces blowing in the U. S. and Canada, only 16 being idle. This compares with 124 in operation and 79 idle on Sept. 1 a year ago.

Shipments of iron ore and coal in August were far ahead of those in the like month last year, reports the Lake Carriers Association. Grain cargoes, however, dropped to the lowest level for August since 1947. Iron ore hauled totaled 13,572,266 gross tons, compared with 9,554,681 a year ago.

Warehouse . . .

Warehouse Prices, Page 171

Low inventories are hampering warehouse men. With mills far behind on commitments, distributors must draw increasingly large amounts from inventories to meet demands, but unbalanced inventories prevent them from doing that fully. If it were not for buyers' willingness to accept substitute specifications upon occasion, distributors would not be able to do as well as they have. Stocks are only half as large as they were a year ago.

Popular sizes in all major lines are becoming increasingly scarce. Mills can't supply large seamless tube, hot-rolled bars, plate, sheet or structural shapes in the fourth quarter on orders placed now. One distributor in the Pittsburgh district that needed plate last week phoned possible sources in Cleveland, Philadelphia, Baltimore and Buffalo before placing a small order at a premium price.

Rails, Cars . . .

Track Material Prices, Page 169

Domestic freight car orders in August totaled 13,405, according to the American Railway Car Institute and the Association of American Railroads. This compared with 18,007 in July, and 2425 in August a year ago. August orders marked the first decline in five months.

Freight car deliveries in the month rose to 3480 from 2192 in July. In August, 1954, deliveries totaled 2297.

Car order backlogs as of Sept. 1 amounted to 52,803 units, against 42,888 on Aug. 1 and 13,013 on Sept. 1, 1954.

Cowles

DRYORTH*

Anhydrous Sodium Orthosilicate

High-powered Cleaning at Low Cost

• Cowles DRYORTH is free-flowing, granular, dust-free. It contains not less than 60% Na_2O and is quickly and completely soluble.

DRYORTH is a fast, economical cleaner for

★ strip and sheet steel
★ steel pipe—before galvanizing
★ heavy ferrous parts and castings

Try DRYORTH for these and other basic cleaning operations. DRYORTH—anhydrous sodium orthosilicate—assures long cleaning mileage at low cost.

*Reg. U. S. Pat. Off.

Cowles also manufactures a complete line of cleaners engineered to handle all kinds of cleaning problems on both ferrous and non-ferrous metals. The Cowles Technical Man in your area will be glad to discuss any metal cleaning problems you have. Write us today!

COWLES CHEMICAL COMPANY
7016 Euclid Avenue
Cleveland 3, Ohio

Structural Shapes . . .

Structural Shape Prices, Page 166

The time is nearing when some seasonal slackening in structural market activity may come. No important easing in demand, however, is noted so far. Most fabricators believe that for some weeks to come demand will continue in excess of their ability to cope with it, especially in the light of short supplies of shapes and plates.

Numerous fabricators have been unable to operate on a normal basis for some weeks because of the stringency in steel supply. In New England they are depending on overdue shipments to sustain operations through the fourth quarter. There has been some improvement in delinquent deliveries, but fabricators still are unable to place orders for all the fourth quarter steel they need. Except at premium prices, they cannot expect shipment of new tonnage placed now before mid-first-quarter.

Tight supply conditions stem from overbooking by the fabricators, and acceptance by the mills of more tonnage orders than capacity can accommodate readily. Some customers of Pittsburgh mills say their fourth quarter shipments will be cut in half by mills. Delivery delays are most acute in wide flange beams and bar-sized angles. Small angles also are tight, production being curtailed by some suppliers in favor of badly needed heavier material.

Because of steel shipment delays, some projects, such as bridges, which use large tonnages of wide flange beams, are subject to deferment. Bridgework currently is picking up in Connecticut.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2000 tons, plant building, International Silver Co., Meriden, Conn., to Bethlehem Fabricators Inc., Bethlehem, Pa.; H. Wales Lines Co., Meriden, general contractor.

2000 tons, plant addition, American Enka Corp., Lowland, Tenn., H. K. Ferguson Co., engineer and architect, to Bristol Steel & Iron Works Inc., Bristol, Va.

1750 tons, power plant, Delaware Power & Light Co., Indian River, Del., through United Engineers & Constructors Inc., Philadelphia, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

1100 tons, office building, 72 Wall street, New York, to Harris Structural Steel Co., New York.

650 tons, grade crossing, Baldwin, Long Island, N.Y., through Hendrickson Bros. Inc., general contractor, to Harris Structural Steel Co., New York.

500 tons, addition to classrooms, Penn State University, State College, Pa., through Ritter Bros., general contractor, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

325 tons, power plant addition, Winchester, Ky., East Kentucky Rural Electric Co-operative Corp., Stanley Engineering Co., engineer, to Bristol Steel & Iron Works Inc., Bristol, Va.

350 tons, Wilkie & Toto creek bridges, Buford Reservoir, Ga.; through Inland Bridge Co. to Bristol Steel & Iron Works Inc., Bristol, Va.

STRUCTURAL STEEL PENDING

2650 tons, approach work on Pennsylvania side, contract P-7, Philadelphia-Gloucester bridge, Delaware River Port Authority, Kaufman Construction Co., Philadelphia, low on general contract.

950 tons, Washington state arch bridge, Skagit county; bids to Olympia, Wash., Oct. 18.

825 tons, contract 37-K, state turnpike extension, Lackawanna county, Pa.; bids Oct. 11.

550 tons, approach work on New Jersey side, contract G-7, Philadelphia-Gloucester bridge, Delaware River Port Authority; F. A. Canuso & Son Inc., Philadelphia, low on general contract.

460 tons, Montana state 698-ft Missouri river bridge, Phillips-Fergus counties, to be readvertised, date unstated; original bids opened July 27, N. A. Nelson Construction Co., Sheridan, Wyo., low at $599,788; not approved by U. S. Bureau of Roads.

350 tons, addition, Kaiser aluminum plant, Tacoma, Wash.; bids in, award pending.

REINFORCING BARS . . .

REINFORCING BARS PLACED

485 tons, reinforced concrete deck, Sakonnet river bridge, Portsmouth-Tiverton, R. I., to Plantations Steel Co., Providence, R. I.; General Engineering & Contracting Co., Providence, general contractor.

360 tons, classified military project, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

90 tons, Seattle warehouse, United Terminals, to Bethlehem Pacific Coast Steel Corp., Seattle; W. M. Yeaman, Yakima, Wash., general contractor.

REINFORCING BARS PENDING

525 tons, mat reinforcing, state highway, Milford, Conn.; in addition to 800 tons of bars for structures; Greenwich-Killingly expressway; bids Sept. 26, Hartford, Conn.

450 tons, also 40 tons of shapes and concrete piling, Washington state overpass, Auburn, King county; bids to Olympia, Wash., Oct. 4

200 tons, Socony-Mobile laboratory, Wilmington, Del.; Baton Construction Co., Philadelphia, low on general contract.

120 tons, Washington state bridge, Skagit county; bids to Olympia, Wash., Oct. 18.

100 tons, Idaho state underpass, Latah county; Walter G. Meyer & Son, Spokane, Wash., low at $56,672.

80 tons, Washington state underpass, Spokane county; C. A. Power, Spokane, Wash., low at $94,765.

PLATES . . .

PLATES PLACED

100 tons, or more, gas system expansion, Portland, Oreg., to Beall Pipe & Tank Co., Portland, by Portland Gas & Coke Co.

PIPE . . .

CAST IRON PIPE PENDING

975 tons, various sizes; bids in at Portland, Oreg.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Atchison, Topeka & Santa Fe, 50 diesel locomotive units; thirty-two 1750-hp road switchers going to Electro-Motive Division, General Motors Corp., La Grange, Ill., and eighteen 1200-hp yard switchers to Fairbanks, Morse & Co., Chicago. These are in addition to 46 units recently placed.

The Utah, one 1600-hp diesel-electric switching locomotive unit, to Alco Products Inc., New York.

RAILROAD CARS PLACED

Missouri Pacific, six sleeping cars, to the Budd Co., Philadelphia.

Canadian Pacific, two rail diesel cars, to the Budd Co., Philadelphia.

RAILROAD CARS PENDING

New Haven, 200 flatcars for hauling highway trailers; bids asked.

BRITISH ENGINEERING GROUP of COMPANIES, manufacturers and producers of heavy engineering equipment, with world-wide reputation and established over a century, has medium-heavy capacity available all types castings, forgings, plate fabrication, machining and erection, and seeks additional products to manufacture under license preferably where selling arrangements for Great Britain and the Sterling Area already established.

Capital Available

Highest references given and required.

Reply Box 310, STEEL
Penton Building Cleveland 13, Ohio

WANTED TO BUY
One Only
20-TON LIP POUR LADLE
LANSING FOUNDRY COMPANY
Mailing Address: Box 71, Lansing 5, Mich.
Plant: 705 Sheridan St., Lansing 4, Mich.

WANTED

Manufacturers Representatives wanted to sell well known line of high frequency induction and dielectric heating equipment. Should have experience and contacts to handle this type of equipment. Various territories available.

Reply Box 311, STEEL
Penton Building Cleveland 13, Ohio

LINES WANTED—OHIO

Experienced Sales Representative desires one or two more lines for Cleveland and North Eastern Ohio. Now selling Fasteners and Wooden Shipping Cases to OEM and wholesale Hardware Distributors. Excellent contacts.

Reply Box 300, STEEL
Penton Building Cleveland 13, Ohio

CLASSIFIED

Help Wanted

INDUSTRIAL ENGINEER, with managerial experience for job galvanizing plant. Periodic incentive bonus. Replies confidential. Reply Box 308, STEEL, Penton Building, Cleveland 13, Ohio.

PLANT MANAGER, preferably with hot dip galvanizing experience. Replies confidential. Reply Box 309, STEEL, Penton Building, Cleveland 13, Ohio.

IF YOU HAVE AN OPPORTUNITY TO OFFER

Use the "Help Wanted" columns of STEEL. Your advertisement in STEEL will put you in touch with qualified, high-calibre men who have had wide training in the various branches of the Metal Producing and Metalworking industries.

...the perfect way **NOT** to buy fasteners!

When you purchase FASTENERS, your first considerations should be given to quality, delivery and prices.

Chandler, as a leading manufacturer of cold forged cap screws, takes the same considerations. Mass production is only part of their story . . . but absolute control during every phase of production means top quality and uniformity.

Realistic pricing is important . . . and is followed.

If your requirements include automotive, Place self-locking, connecting rod or aircraft engine bolts in high carbon alloy and stainless steels, check with Chandler today. They are prepared to produce special heads, drilled heads and shanks, and ground bolts to tolerances as close as 0.0005-inch.

Write today for literature.

Specialists in Thread-Rolling after Heat Treating.

CHANDLER PRODUCTS CORPORATION

1488 Chardon Road • Cleveland 17, Ohio

6473-CH

Advertising Index

Acme Steel Co., Acme Steel Products Division 144, 145
Aetna-Standard Engineering Co., The ..... Inside Back Cover
Allegheny Ludlum Steel Corporation 52
Allis-Chalmers ..... Inside Front Cover
Alter Co., Alloy Metal Division 158
American Broach & Machine Co., A Division of Sundstrand Machine Tool Co. 176
American MonoRail Co. 61
American Screw Co. 51
American Smelting & Refining Co., Federated Metals Division 152
American Society for Metals 122
American Steel & Wire Division, United States Steel Corporation 40
American Welding & Mfg. Co., The 62
American Zinc, Lead & Smelting Co. 163
American Zinc Sales Co. 163
Arcos Corporation 174, 175
Arter Grinding Machine Co. 96
Associated Spring Corporation 13
Atlas Car & Mfg. Co., The 10
Avondale Marine Ways, Inc. 172

Babcock & Wilcox Co., The, Boiler Division 50
Babcock & Wilcox Co., The, Refractories Division 121
Baker-Raulang Co., The 3
Barium Steel Corporation 55
Barnes, Wallace, Co., Wallace Barnes Steel Division 13
Barry Controls, Inc. 48
Bethlehem Steel Co. 1
Birdsboro Steel Foundry & Machine Co. 46
Bliss, E. W., Co., Mackintosh-Hemphill Division 93
Bridgeport Brass Co. 148
Browning, Victor R., & Co., Inc. 182
Bullard Co., The 142

Carboloy Department of General Electric Co. 60
Carborundum Co., The, Refractories Division 33
Carpenter Steel Co., The 44
Carpenter Steel Co., The, Alloy Tube Division 22
Chambersburg Engineering Co. 53
Chandler Products Corporation 188
Chicago Rawhide Manufacturing Co., Sirvis Division 77
Chicago Tramrail Corporation 105
Cincinnati Cleaning & Finishing Machinery Co., Inc. 88
Cincinnati Grinders, Inc. 78
Cincinnati Milling Machine Co., The 78
Cincinnati Shaper Co., The 24, 25
Cities Service Oil Co. 47
Cleveland Hotel 183
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 127
Cold Metal Products Co., The 119
Colorado Fuel & Iron Corporation, The 34, 35, 101
Columbia-Geneva Steel Division, United States Steel Corporation 37,40
Continental Foundry & Machine Co. 147
Cooper Alloy Corporation 89
Cowles Chemical Co. 186
Cowles Tool Co. 180

Detrex Corporation 110
Detroit Steel Corporation, Reliance Steel Division 66

Eastern Machine Screw Corporation, The 182
Elastic Stop Nut Corporation of America 103
Electro Manganese Corporation 49
Electro Metallurgical Co., A Division of Union Carbide & Carbon Corporation 32
Erie Bolt & Nut Co. 16
Erie Foundry Co. 36
Exide Industrial Division, The Electric Storage Battery Co. 57

Federal Products Corporation 134
Federated Metals Division of American Smelting & Refining Co. 152
Ferry, E. W., Screw Products, Inc., The 12
Firth Sterling, Inc. 104

Gardner Machine Co. 11
General Electric Co., Carboloy Department 60
General Motors Corporation, Saginaw Steering Gear Division 23
Gisholt Machine Co. 17, 18, 19, 20
Globe Brick Co., The 154
Globe Steel Abrasive Co. 102
Gould-National Batteries, Inc. 42
Great Lakes Steel Corporation 82
Gregory Industries, Inc., Nelson Stud Welding Division 100

Hepponstall Co. 90
Heyl & Patterson, Inc. 21

Ingalls Iron Works Co., The 177
Inland Steel Co. 68

Johnson Steel & Wire Co., Inc. 150, 151
Jones & Laughlin Steel Corporation 161
Jones & Laughlin Steel Warehouse Division, Jones & Laughlin Steel Corporation 138, 139

Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemicals Division 26
Keystone Drawn Steel Co. 182
Koppers Co., Inc., Engineering & Construction Division 58, 59
Koppers Co., Inc., Tar Products Division 108

Lake Erie Engineering Corporation 132, 133
Lamson & Sessions Co., The 155
Landis Machine Co. 7
Leschen Wire Rope Division, H. K. Porter Company, Inc. 27
Lindberg Engineering Co. 98, 99
Lovejoy Flexible Coupling Co. 6
Luria Brothers & Co., Inc. 185

McKee, Arthur G., & Co. 153
McLouth Steel Corporation 109

Mackintosh-Hemphill Division of E. W. Bliss Co. 95
Manheim Manufacturing & Belting Co. 41
Metzger Conveyor Co. 182
Michigan Tool Co. 45
Minnesota Mining & Mfg. Co. 106, 107

National Acme Co., The 165
National Metal Exposition & Congress 122
National-Standard Co. 43
National Steel Corporation 82
National Tube Division, United States Steel Corporation 40
Naugatuck Chemical Division of United States Rubber Co. 135
Nelson Stud Welding Division of Gregory Industries, Inc. 100
New York State Department of Commerce 130
Niagara Machine & Tool Works 8, 9
Nice Ball Bearing Co. 180
Nobur Manufacturing Co. 182
Norgren, C. A., Co. 137

Norton Co. 56
Norton Co., Machine Division 28, 29

Ohio Crankshaft Co., The 2
Ottawa Steel Products, Inc. 183

Pangborn Corporation 189
Pittsburgh Crushed Steel Co. 183
Pittsburgh Plate Glass Co., Brush Division 180
Pittsburgh Steel Co. 150, 151
Porter, H. K., Company, Inc., Leschen Wire Rope Division 27

Reliance Steel Division, Detroit Steel Corporation 66
Republic Steel Corporation 14, 15
Research-Cottrell, Inc. 124, 125
Rockford Machine Tool Co. 128, 129
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 101
Ryerson, Joseph T., & Son, Inc. 65

Saginaw Steering Gear Division, General Motors Corporation 23
Sciaky Bros., Inc. 93
Service Steel 180
Seymour Mfg. Co., The 5
Steel Shot & Grit Co. 183
Stuart, D. A., Oil Co., Ltd. 190
Sundstrand Machine Tool Co., American Broach & Machine Co. Division 176

Tennessee Coal & Iron Division, United States Steel Corporation 37, 40
Thomas Flexible Coupling Co. 156
Thomas Machine Manufacturing Co. 179
Timken Roller Bearing Co., The ..... Back Cover

Union Carbide & Carbon Corporation, Electro Metallurgical Co. 32
United Engineering & Foundry Co. 157
United States Rubber Co. 136
United States Rubber Co., Mechanical Goods Division 30
United States Rubber Co., Naugatuck Chemical Division 135
United States Steel Corporation, Subsidiaries 37, 38, 39, 40
United States Steel Export Co. 37, 40
United States Steel Supply Division, United States Steel Corporation 37, 40

Vander-Roof, Inc. 4
Verson Allsteel Press Co. 85

Ward Steel Co. 181
Wean Engineering Co., Inc., The 31
Wesson Co. 86
Wheelabrator Corporation 54
Wheland Co., The 181
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 34, 35

~ ~ ~

Table of Contents, Page 5

Classified Advertising, Page 187

PUZZLED by a dust problem?

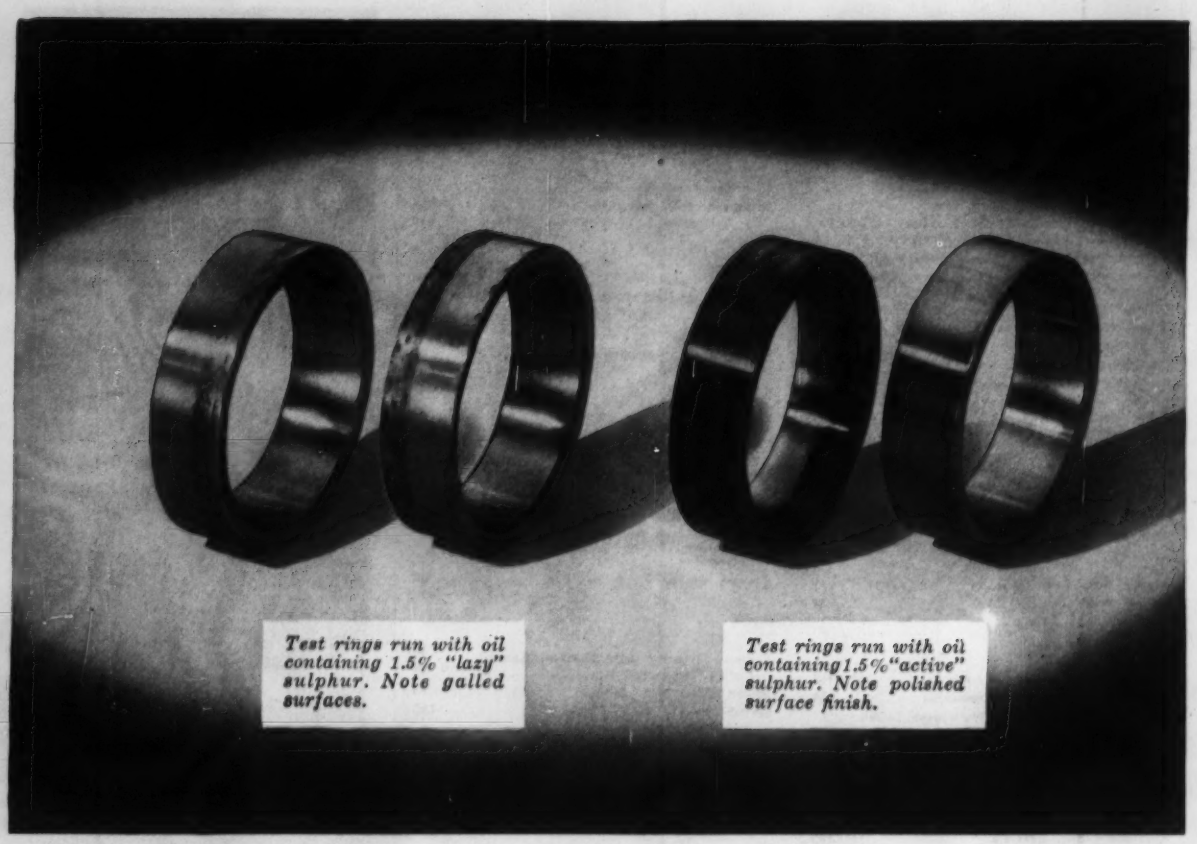
Pangborn can solve it for you!

Pangborn Unit Dust Collectors give thorough, efficient dust control at any individual operation. Requiring little floor space, they can be located anywhere. Use the Pangborn Dust Collector to:

- **Reclaim valuable material**
- **Reduce dust damage to expensive machinery and finished products**
- **Cut plant housekeeping costs**
- **Speed production — improve working conditions**

Investigate Pangborn Unit Dust Collectors now! Shipped assembled ... $545 and up. For details, write to: PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Dust Control and Blast Cleaning Equipment.*

Pangborn
CONTROLS DUST



Test rings run with oil containing 1.5% "lazy" sulphur. Note galled surfaces.

Test rings run with oil containing 1.5% "active" sulphur. Note polished surface finish.

Only ACTIVE Sulphur Provides Fluid Lubrication Under Extreme Pressures

This comparative test proves it! Both tests were run on an SAE Lubricant Tester using two oils with the same percentage of sulphur. The specifications were similar—but look at the results!

The set of rings on the left were run with an oil containing "lazy" sulphur that did not provide the necessary anti-weld qualities. Under the heavy loads present in the test, the rings quickly galled and seized. The pair on the right were run with an oil containing "active" sulphur, the *only* type of sulphur that will prevent galling or seizure. It is performance that counts, not specifications.

"Active" sulphur in a cutting oil, readily reacts with the metal surfaces of the tool, chip and workpiece to produce metallic sulphide films that become fluid lubricants when sufficient heat is generated, and provide lubrication under the high temperatures that exist in the cutting orbit.

Stuart Oil Company's Shop Note Book, Bulletin S-2, contains further information on how to select a sulphurized cutting oil. Write for your copy today, and ask to have "the Man in the Barrel", your Stuart Representative, call too. He will help you select the cutting fluid that will provide the very best results under the conditions you will subject it to.

D.A. STUART OIL COMPANY, LTD.
2735-37 S. Troy St., Chicago 23, Ill.

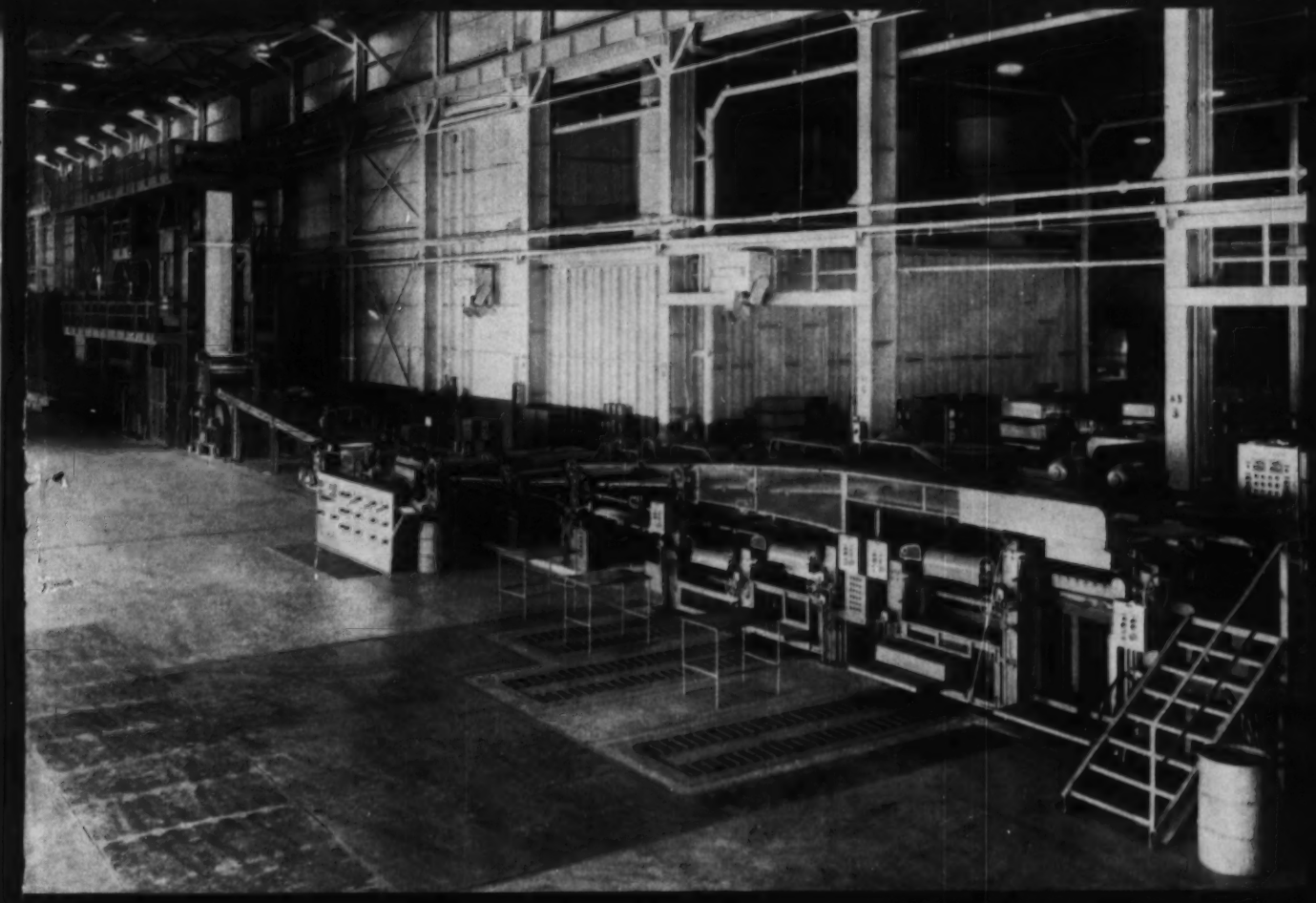
More than a "Coolant" is Needed

Stuart Oils

Time Tested Cutting Fluids and Lubricants

Plants in: Chicago, Detroit, Cleveland, Hartford, and Toronto, Ontario.

Branch Warehouses and Representatives in principal metal working centers in the United States, Canada and Europe.



NEW ELECTROLYTIC TINNING LINE

"Ferrostan" Electrotinning Line Acclaimed

built by ***AETNA-STANDARD***

for TENNESSEE COAL & IRON DIVISION, U. S. STEEL CORPORATION

More rugged design, improved Tracking, Shearing and Classifying, Pickling and Cleaning. Line is designed to be the largest capacity, highest speed line of its type to date.

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

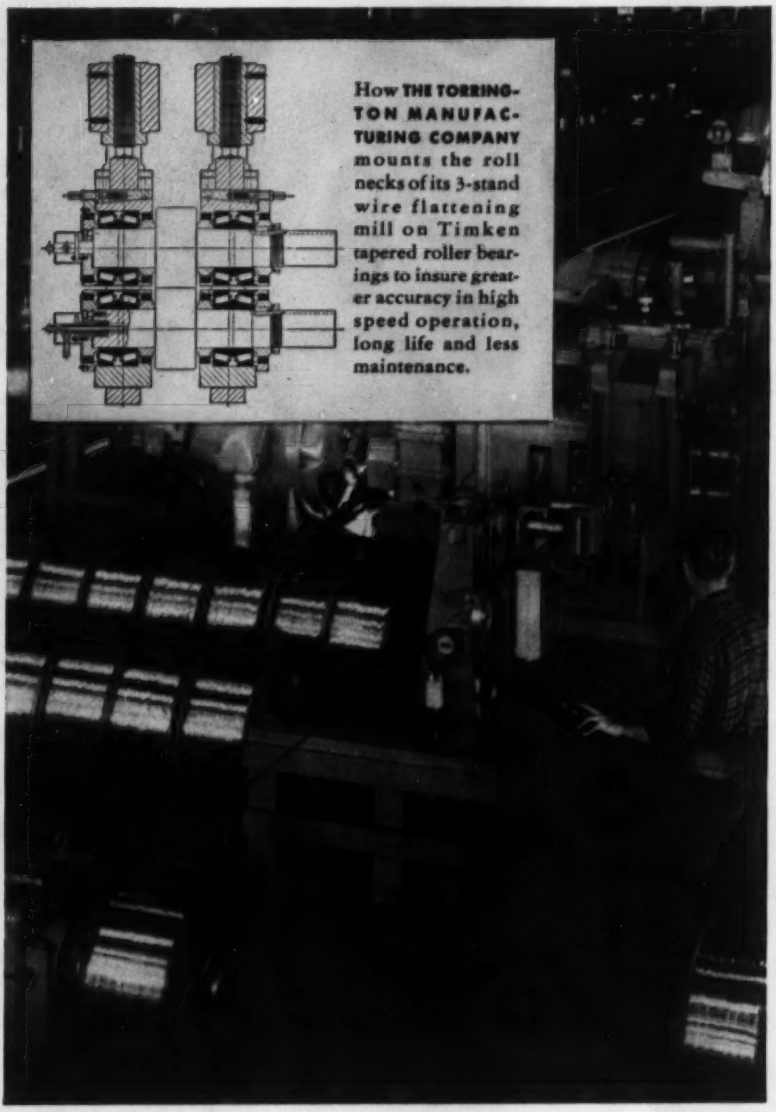
Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

New wire flattening mill accurately shapes 2000 feet of wire per minute

. . . with help of TIMKEN® bearings



How **THE TORRINGTON MANUFACTURING COMPANY** mounts the roll necks of its 3-stand wire flattening mill on Timken tapered roller bearings to insure greater accuracy in high speed operation, long life and less maintenance.

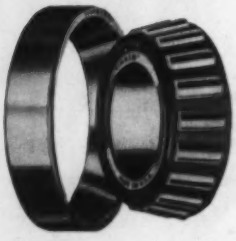
THE 3-stand wire flattening mill pictured at left, in operation at the Ansonia, Conn. branch of The American Brass Company, rolls up to 2000 feet of brass or copper wire per minute. It reduces the wire and changes its shape by rolling both flatwise and edgewise. To maintain accuracy at high speeds, The Torrington Manufacturing Company uses 62 Timken® tapered roller bearings on the roll necks and on the reduction drives.

Timken bearings hold the roll necks rigid, insure greater accuracy in the finished product. That's because Timken bearings take both the radial and thrust loads in any combination. They also reduce the amount of power required to run the mill because the true rolling motion and smooth surface finish of Timken bearings practically eliminate friction.

On the reduction gears, Timken bearings keep shafts in proper alignment, keep gears meshing accurately with a minimum of wear. There's less chance of breakdowns caused by excessive gear wear.

Always specify Timken bearings in the equipment you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



TIMKEN

TRADE-MAR REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

IT'S TIMKEN BEARINGS FOR VALUE!

To get the best value in bearings you may find this simple formula helpful:

$$Value = \frac{quality + service + public\ acceptance}{price}$$

Obviously a big advantage *above* the line gives you more value than a small one *below*. No other bearing can match the uniform high quality, engineering and field service and overwhelming public acceptance you get with Timken bearings.

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬭ AND THRUST ⬭ LOADS OR ANY COMBINATION